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CONTENTS.

An Asterisk (*) denotes an illustrated article

OFFICIAL NOTICES—
Seventeenth Annual Meeting, Western Gas Association..... 653
May Meeting, Society of Gas Lighting..... 653
American Gas Light Association..... 654
EDITORIALS—
Briefly Told 654
Secretary Littleton's "Last Words"—The Brooklyn Gas Rate War—The Retirement of Mr. A. C. Humphreys.
The Decision of the Board of Gas and Electric Light Commissioners in the Matter of the Arlington (Mass.) Petition..... 654
Inaugural Address of Mr. Norton H. Humphrys before the Southwest of England District Association of Gas Managers..... 655
*Wood's Improvement in Gasometer Construction..... 658
London Coal Gas and its Enrichment, by Prof. V. B. Lewes..... 659
Mr. Humphreys' Retirement from Service with the United Gas Improvement Company 661
ITEMS OF INTEREST FROM VARIOUS LOCALITIES 663
The Ottawa (Kansas) Company Changes Hands—Annual Meeting, Rochester, Minn.—The Clinch Valley Miners Refuse to Join the Strikers—Sale of the Schenectady (N.Y.) Plant—Contract for the Berlin Iron Bridge Company—The San Francisco Company to Build an Office Structure—Some Changes in the American Gas Company—Annual Meeting, Florence, Ala.—Extending the Cincinnati Works—Death of Mr. Chas Truesdell—Mr. W. A. Allen to Take Charge of the Mutual (N.Y.) Works—Cheaper Gas for Gloucester, Mass—To Go on with the Works at Laconia, N H.—Annual Meeting, Sandusky, Ohio—The Lumbermen's Association and the South Chicago Gas Works—Annual Meeting, Columbus, Ohio The Shenandoah (Pa.) Company in New Hands—The Brooklyn Gas Rate War—Hearing on the Petition for Cheaper Gas for Cambridge, Mass—And Other Items.
The Synthesis of Ammonia 665
The Calibration of Indicators..... 665
The Market for Gas Securities 666

[OFFICIAL NOTICE.]

Seventeenth Annual Meeting, Western Gas Association.

SECRETARY'S OFFICE, WESTERN GAS ASSOCIATION, QUINCY, ILLS., May 2, 1894.

The seventeenth annual meeting of the Western Gas Association will be held at Cleveland, O., on the 16th, 17th and 18th of May.

The Hollenden, strictly first class in all its appointments, will be the Association's headquarters, and its business sessions will also be conducted therein. The rates at the Hollenden will be as follows: On the American plan, $3, $3.50, $4 and $5 per day. On the European plan, $1, $1.50, $2, $3 and $3.50 per day.

It is intended that an exhibit of gas appliances shall form one of the prominent features of the Cleveland meeting, and to this end a commodious storeroom, directly across the street from the Hollenden, has been engaged. Manufacturers and dealers in stoves, ranges, burners, lamps, engines and all forms and types of apparatus or machinery by which the manifold uses of gas can be exhibited, are respectfully invited to display their wares; and they can feel assured that, on this occasion, the same will be critically inspected by large and appreciative audiences. Communications on the subject can be addressed to Mr. M. S. Greenough, General Manager of the Cleveland Gas Light and Coke Company, who will take pleasure in furnishing to exhibitors all requisite information in the matter.

So far the applications for space from exhibitors have far exceeded the anticipations of those in charge of the exhibition, and the members are assured that the display will be both comprehensive and interesting.

The following papers will be presented for the consideration of the members of the Western Gas Association on the occasion of its seventeenth annual meeting:

"Street Main Pressure," by Irvin Butterworth, Columbus, O.

"Some of the Advantages of Oil Gas Works for Small Towns," by J. W. Stratton, Valparaiso, Ind.

"The Best Method of Introducing Gas Stoves," by H. Wilkiemeyer, Evansville, Ind.

"Three Years in a Country Gas Works," by S. M. Highlands, Clinton, Ia.

"History of the Gas Meter," by Wm. McDonald, Albany, N. Y.

"How to Make Small Electric Light Plants Pay," by I. C. Copley, Aurora, Ills.

"Influence of Temperature on Purification," by Jas. Ferrier, Columbus, Ga.

"Report of the Committee on Electrolysis," by Geo. T. Thompson, Jas. Somerville and Alten S. Miller.

Geo. T. Thompson, of the Laclede Gas Light Company, St. Louis, Mo., has been appointed Superintendent of the Wrinkle Department for the coming meeting, and to him should be addressed all contributions to or communications bearing on subjects connected with said department, while all matter for the Question Box should be mailed to the Secretary. The contributions for the "Wrinkle" department already announced are:

"Some Retort House Devices" (four in number); and,
"Admission of Air for Reviving Iron Oxide," by Jas. W. Dunbar.
"Stack Valve for Chimneys," by Arthur Finnegan.
"Using a Dry Meter, Admitting Air for Revivification;" and,
"Basket for Melting Out Lead Joints," by Geo. T. Thompson.
"Signalling Excessive Vacuum at the Exhauster," by Jas. Ferrier.
"Safety Arrangement for Seals," by Irvin Butterworth.
"Bye Passing the Lower Tray of a Purifier," by E. H. Jenkins.
"Filter for Tar Well Overflow;" and,
"Using Bench Waste Gases Under a Boiler," by C. M. Keller.
"Analysis of Gas by Inspection," by O. O. Thwing.
"Portable Pipe Vise Bench," by B. E. Chollar.
"Taking Gas Temperatures at the Consumer's Meter," by H. W. Douglas.

The Committee of Arrangements—Messrs. M. S. Greenough (Chairman), D. R. Warmington, C. M. Higgins, Chas. R. Faben, Jr., Irvin Butterworth and Joseph Light—announce that a complimentary dinner will be tendered to the members of the Association, by the Gas Companies of Cleveland and some of the manufacturers of the same city, at the Hollenden, at 8 o'clock, P.M., Thursday, May 17th.

A meeting of the Board of Directors of the Association will be held at the Hollenden, at 10 o'clock, A.M., Tuesday, May 15th, and it is earnestly hoped that every member of the Board will find it convenient to be present.

A hearty invitation is hereby extended to the members of kindred Associations to be present at the meeting and to participate in its proceedings; and this invitation is further extended to the fraternity generally.

Rates of one and one-third fares for the round trip will be made, by the various Passenger Associations, to our members and their friends. This reduction is based on the certificate plan, as in former years. The territory in which the reduced transportation rates are available extends from the western border of the New England States to the Mississippi river, and from the Ohio river, north, to the great lakes, including the larger part of the Province of Ontario, but not Wisconsin. The Southern Passenger Association declined to make the reduction. The Secretary will be pleased to mail the necessary blanks to those who will avail themselves of this rebate, and he would also note that 100 fares are essential before the rebate takes effect.

The undersigned will be pleased to reply to all communications requesting detailed information concerning the meeting, not covered by this announcement and the notice which is to follow.

A. W. LITTLETON, Secretary.

[OFFICIAL NOTICE.]

May Meeting, Society of Gas Lighting.

OFFICE OF THE SECRETARY, May 2, 1894.

The May meeting of the Society will be held at the 18th street (West) station of the Consolidated Gas Company, New York city, on Thursday, May 10, at 3 o'clock, P.M.

FRED. S. BENSON, Secretary.

[Official Notice.]

American Gas Light Association.

Office of the Secretary, Providence, R. I., May 3, 1894.

To all Members of the Council: By direction of the President, I hereby give notice that there will be a meeting of the Council of this Association on May 15, 1894, at 8 P M., at the Hollenden, Cleveland, O.

As the business of the meeting includes much matter of importance besides the ordinary routine, every member is specially urged to attend.

Respectfully, A. B. Slater, Jr., Secretary.

BRIEFLY TOLD.

Secretary Littleton's "Last Words."—The revised official announcement presented in this issue by Secretary Littleton respecting the Western Association's coming meeting, from which we are now virtually separated by only a week, goes to prove, if further proof were needed, that the convention is to be in all respects a success. The project for holding an exhibition of gas appliances has been so warmly favored by the manufacturers, who have been persistent in their applications for space, that the Secretary feels warranted in proclaiming, "The display will be both comprehensive and interesting." Such words as these from the cautious and never over enthusiastic Littleton are enough to make it a certainty that the exhibition will well surpass anything of the kind ever before attempted in the States, and Mr. Greenough is to be congratulated over the result of his labors. It will be noted that the paper promised by Mr. Evans, of Chicago, has been withdrawn, the imperative demands of business upon his time unfortunately preventing him from preparing it. A look a trifle further along the notice, however, brings us to the contributions so far promised for the "Wrinkle" department, and we all well may exclaim after its scanning, "Here's richness." Even the President finds himself disposed to supplement his inaugural message with something in the wrinkle line, a determination most fraternal and praiseworthy. Indeed, the wrinkle list would form the nucleus of an excellent technical session, were nothing else in the shape of "food for thought and discussion" to be presented. It is to be hoped that members will avail themselves of the Secretary's promise to forward them blanks necessary to secure the transportation rebate, a saving which it is well worth while in these hard times to make.

The Brooklyn Gas Rate War.—The bushwhacking in gas rates that has been quietly going on in Brooklyn for some time back has been brought to an end by an open declaration of war, three Companies—the Williamsburgh, the Fulton Municipal and the Peoples—having announced in the public prints their purpose of selling gas at $1 per 1,000 cubic feet, "until further notice." Brooklyn always was a queer place, and we presume it contains a larger proportion of queer people than any other city on the face of the earth. Its business men—Heaven save the mark!—conduct their affairs on a meaner scale than any other business men in the world; and as for comity of feeling between them and others, in similar lines of trade outside their own city, why such feeling simply does not exist. They snarl at one another like mongrels contending for a bone, and share with the mongrels the indifference of the latter to the effects their howling may have on others. The East River, nowhere in its course over a mile wide, separates Brooklyn from New York, and the gas producers of the latter city have plenty of cause for regret that the river which divides them is not as wide, as broad, as deep and as turbulent as the Atlantic Ocean. But, to use Mr. Cleveland's aphorism, unfortunately it is a condition and not a theory which confronts us, and the condition is this: During the last session of the Legislature many feared that the lawmakers would insist on the passage of a law putting the gas rate at $1 per 1,000 cubic feet for the cities of New York and Brooklyn, and the New York city Companies used all their diplomatic efforts to prevent such a result. They were successful, but to what good end, when all their strategy is upset by the Brooklyn snarlers, who ere the Legislature is fairly dismembered, blatantly put themselves on record as being anxious to do of their own free will what the main parties to the present conflict virtually swore before another Legislature of a few years back would consign them to bankruptcy. No one would care greatly if the Brooklyn Companies scraped one another to the bone, nor would there be much sorrow if the flesh was never restored to them, yet their present asinine action must affect every other company in the country in a harrassing way. Meanwhile we venture the prediction that when the Nassau Company, which up to the present time has loyally stood to the legal rate in the State, enters the pit, some of the rest will assume the position of the under dog, for it is not unlikely that the White Leggett combination (which controls the Nassau's affairs) will see the way clear to instituting a 50 cent—possibly a 25 cent rate. Stable and sound interests must be protected, and such interests usually know the way to secure such protection. Since the war is on, let it be to the knife. Meanwhile, out of the dirty mess steams the hope that when the process of blood letting is at end some of the incompetents who have marred the Brooklyn gas situation for an all too lengthy period by their presence will have been effectually squelched. The gas supply of the country ought to be too big a thing to be endangered by the personal whims and malice of a pack of very small persons.

The Retirement of Mr. A. C. Humphreys.—Elsewhere in our columns will be found a lengthy notice of the action taken by the United Gas Improvement Company and its employees on the occasion of the announcement by Mr. A. C. Humphreys that he would retire from its service on the 1st of August. To that notice we can add nothing on our own account, save to say that while the Journal often differed with him we ever found him an honest opponent. The U. G. I. Company owes much of its success to his cleverness, and it is undeniable that his best efforts were unremittingly put forth on its behalf.

The Decision of the Board of Gas and Electric Light Commissioners in the Matter of the Arlington (Mass.) Petition.

This is a petition of the consumers of the Arlington Gas Light Company for a reduction from $2.50 per 1,000 in the price of gas.

The facts, as they appear from the records of the Company, from its return to this Board, and the testimony offered at the hearing, were as follows:

The Company was organized under the title of the West Cambridge Gas Light Company, in May, 1857. In 1860 the works were built and paid for in stock of the Company. From the testimony of one of the parties who built the works it appears that they cost about $20,000 and were capitalized, upon the organization of the Company, at $40,000. Later in the same year pipes were laid to Belmont and Winchester, for which stock was issued to the party who laid them. In 1867 land was purchased for a new holder in Winchester, and the name of the Company changed to the Arlington Gas Light Company. Meanwhile there had been dividends of 2 per cent. in 1861, 1862 and 1867. No dividends were then declared until 1869, when one of 6 per cent. and a scrip dividend of $17 a share was made, which was subsequently paid in cash. No dividends were then declared until 1879, when they paid 6 per cent., and have paid this amount annually up to date. The average rate of dividend up to 1879 was 2.2 per cent., the rest of the profits having been spent in the development of the plant.

The works to-day seem upon examination to be in fair condition and of sufficient capacity to supply all the gas that will be required under ordinary growths of population and business, and could not be replaced for a less sum than the amount of the capital stock of the Company.

From the returns the output is shown not to have varied materially from 6,000,000 feet since 1886, although the number of consumers has increased from 327, in that year, to 449 in 1893. In 1888 the town began to light its streets with electric lights and ceased to use gas for that purpose. The price of gas was reduced by the Company, in 1892, from $2.75 to its present price, $2.50 per 1,000 feet. The net income of the Company last year was almost exactly equivalent to the 6 per cent. dividend paid. If a reduction in the price of gas be made in this case, the result as affecting the net earnings of the Company cannot be in doubt, for it is not probable that any reasonable reduction will be attended by such an increase of consumption as to bring the net income up, for the present at least, to what it was before the reduction.

If the output of gas in the district is small, it is clear that each 1,000 feet has to carry heavy burdens in the shape of expenses and fair dividend charge, so that gas will always seem to be relatively dear in that district. When the small district is near a larger one, the inequalities of prices paid by neighbors, separated only by a town boundary, seem unfair to the consumers in the smaller district; but such a case does not really differ from that of an isolated district of the same size, in which the consumers might be quite satisfied with the fairness of the price charged for the gas. Such cases then are always full of difficulty.

The customers of this Company cannot expect a substantial decrease of the price of gas per 1,000 feet, unless there is at the same time a substantial increase in the amount of gas consumed in the district.

We have here the case of a Company whose plant and mains may be considered in their present shape to be fully worth the amount of the capital of the Company, $70,000, its present net income being a little over $4,000. Such a net income does not seem to justify the present rate of dividends, as, after 6 per cent. is paid upon the capital, there is no balance left to apply to further extensions or improvements; and it does not seem, in view of the above facts, that the Arlington Gas Light Company can reasonably be required, until their present output is increased, to furnish gas at a less price than $2.50 per 1,000 feet. For these reasons the Board does not feel justified in recommending a reduction from the present price.

[From proof sheets forwarded by Mr. Humphrys.]

Inaugural Address of Mr. Norton H. Humphrys before the Southwest of England District Association of Gas Managers.

In rising to address you, my first thought is one of gratitude to the numerous friends who have—in some instances at considerable inconvenience and trouble—expressed their sympathy with your President, by attending here to-day. A glance round the room at the many familiar faces, tempts one to launch out into personal references; but as that would savor too much of the mutual admiration socie'y class of thing (which outsiders sometimes tell us is a little too evident at these gatherings), I must be satisfied with thanking you one and all for the many kindnesses received from time to time—both in a personal sense and as the Honorary Secretary of your Association for the last nine years. But without being invidious, one exception can be made, by congratulating our venerable friend who is supporting me on my right, and who has thrown himself with all the energy of nineteen instead of nearly ninety, into several details connected with the preparations for our meeting here to-day. It is now about ten years since he expressed doubts of ever attending another meeting; but here he is to day, and we may well hope to see him with us for another decade. Gentlemen, it is with real pleasure that we welcome you here to day, and express the hope that you will find it a time of benefit and enjoyment.

The position of our Association should be a matter of moment to each member. How does it stand now? And what has it done in the past? Taking a careful survey of its history, I venture to claim that it has justified its existence. As compared with similar associations, it labors under several disadvantages. One of these societies is able to meet on Saturday afternoons. After a social tea, the members return home; and I presume they all reach their respective residences the same even ing. But in the straggling Southwest district, extending from Portsea to Pembroke, and from London to the Land's End (we do not claim the Scilly Islands), it is impossible to select a rendezvous that does not in volve a long day for the majority, and one night in a strange bed for a good round dozen. In many parts of the country, the socially-inclined gas engineer can call upon two or three of his fellows in the course of an afternoon stroll; but the members of this Association average nearly twenty miles apart. Take our present location for an example. Our nearest neighbor has had to travel 12 miles, and the next in point of distance 18 miles, in order to be with us to-day. The geographical situation is such that, instead of talking about small meetings, one should rather compliment the vitality of the Association in being able to have any meeting at all. There is another drawback. The demand for gas in most of our Southwest towns is small. With one or two exceptions, they are simply residential places, occupied by persons that may be ranked as very moderate middle-class people. So that, after marking off the gas works in some half dozen towns, the remainder come under the head of small gas undertakings; and the majority of our members are too much occupied in running the daily round of detail that is incidental to a small works—where the manager, with perhaps an assistant or a clerk, constitutes the whole of the band—to take up the special engineering or scientific questions that are so ably dealt with in other parts of the country. A very ordinary factory town in the North or Midlands would take the whole of the gas manufactured in Wiltshire, and possibly the supply of Dorset as well. It is therefore evident that we are disadvantageously circumstanced, as compared with Associations covering compact and populous districts.

During the last nine years, we have held 18 meetings, in 14 distinct towns. In addition to the advantage of inspecting the gas works in each district, we have visited the Kensal Green station of The Gas Light and Coke Company, the Severn Tunnel, the Great Western Railway Works at Swindon and at Wormwood Scrubs, and several other places of interest. So the opportunities for that friendly intercourse and informal consultation, which this Association seeks to foster and encourage in every possible way, have been numerous. Appended to this address is a list of the papers read at the meetings, with a figure indicating the number of speakers in the discussion that followed the reading of each communication, which affords some insight into the nature of our pro ceedings. You will find that this list includes nine Presidential addresses, and 35 communications from 21 members and 4 non-members of the Association. Messrs. Durkin, Jervis, and Riley have each read three papers, exclusive of an Inaugural Address in each case, and have thus practically illustrated their interest in our proceedings in a manner that deserves our cordial recognition. It is well to applaud a good action, but better still to copy it; and I hope that some whose voices are as yet unknown may be induced by such excellent examples to take a more prominent share in the work of the Association. The addresses have touched upon a wide variety of subjects incidental to our industry; and of the papers, 11 were devoted to retort house apparatus, 4 to purification, 2 to naphthaline, and 5 to the supply and sale of gas. Among the other subjects treated, will be found public lamps, testing mains, manufacture of sulphate, storeage of coal, carbureting gas, and main laying. The highest number of speakers in any one discussion was 11; seven or more took part in several instances, and the average is about six.

It is not possible to estimate the exact degree of benefit afforded by these proceedings; but tangible evidence of such is not wanting. Especially in connection with retort houses and purifiers, our discussions have resulted in practical effect; and improvements suggested in this way may be recognized in many gas works in the district. Our Association has also been the means of disseminating a great deal of practical information in regard to the manufacture of sulphate of ammonia on a small scale. This product is now a matter of commercial success in gas works carbonizing 1,000 tons of coal, or even less, per annum; and more than one of our friends has reason to bless the day when he came to a Southwest Association meeting, quietly button-holed Mr. Sainsbury or Mr. Jervis, and in ten minutes learned as much about how to make and how to sell sulphate as he could have acquired in a month in any other way. The delicate and many-sided question of how to deal with consumers of gas in the matter of offering apparatus on hire, or other inducements in the direction of new and increased business, has been decidedly shaped by this Association.

In the period under review, our membership has been well maintained. In 1885 the list of members included 69 names; and this is now increased to 76. Nearly the whole of the towns in the district were already represented; so anything in the way of a substantial increase was not to be expected, as there was no scope for it. Although comparatively young (having been in existence for a very few years), the Association had attained a robust adolescence at the beginning of this period. Its rapid development to full dimensions in such a brief space of time, was largely due to the exertions of my predecessor at the secretarial desk—Mr. T. W. R. White, of Sherborne—whom we are glad to see amongst us to day; and it stands as a most satisfactory evidence of the executive ability possessed by that gentleman.

It is not to be expected that the grim reaper would be absent; and of those whose loss we deplore, a special reference may be made to Mr. William Osmond and Mr. H. G. Crowe. The presence of these gentlemen was always looked for; and it was a rare thing for us to be without their helpful assistance at the meetings. They were as much at home in the business proceedings as in the social gatherings connected therewith, the enjoyment of which was greatly enhanced by their jovial good humor. I mention these two gentlemen together because they resembled each other in many respects, not the least of which was the warm interest they exhibited in the objects of this Association, and the hearty support they always accorded to it. Another friend whom we have lost is Mr. W. Upton Tinney, whose hospitable welcome of the Association at Winchester will not soon be forgotten. Within the last few weeks we have been saddened by the news of the decease of Mr. H. F. Willey, of Exeter, who has been an energetic member of this Association for many years. When his health permitted, he attended our meetings; and when present he always took an intelligent interest in the proceedings, and frequently joined in the discussions. Since the issue of the notices convening this meeting, we have also learnt with regret of the decease of Mr. John Allan, who, although not one of our members, was a regular attendant at the gatherings, as the representative of the *Gas World*, and as such had made many personal friends in the Southwest district.

We will next glance briefly at a few modifications of the rules that have been introduced. There have been no real alterations, as the objects in view have not altered in any way, since the day of our first meeting; and the changes that have been made have only been such as the results of experience suggested for the better and more efficient carrying out of the original programme. The adoption of ex-Presidents as Members of Committee was suggested as a means of meeting the difficulty of getting together a quorum for a Committee meeting, and also of utilizing the valuable experience acquired by each gentleman during his year of Presidency. It has been usual to place the seats on Committee equally in all parts of the district, in order to avoid any suspicion of cliquism; but when we have one Committee man in the Isle of Wight, another in Pembrokeshire, and a third in Cornwall, the prospects of getting a full Committee are extremely uncertain. At present, the rule works exceedingly well. We secure an attendance of eight or ten in Committee, which is sufficient to ensure that the affairs should be managed with strict independence. A change has been made

in the procedure for electing officers, by adopting the plan of issuing nominations, as now generally used by scientific and engineering societies. It was introduced to meet the difficulty that may arise through any gentleman refusing to accept the decision of a meeting. The rules assume that every member is willing to take an equal share in conducting the work of the Association; but experience has shown that several are either unwilling or so circumstanced that they are unable to do so. In one instance, a gentleman who had occupied the position of Vice-President, and was about to be elected President after the usual custom, declined to accept office, and great inconvenience was occasioned there by. This incident alone shows the necessity that the Committee should be prepared, at each election, with the names of candidates willing to accept office. The existing officers cease to hold their respective posts at the expiration of a stated time; and if others are not at hand to succeed them, the affairs of the Association would come to a deadlock. The nomination papers were introduced to avoid this complication. The only objection urged against them, to my knowledge, is that the Committee have too much power, and are able, if so inclined, to influence the election of their own particular friends. This objection would never be raised by anyone who has had any experience in the working of our Association. There are no salaries or other emoluments, direct or indirect; and the difficulty is to find competent candidates for office, rather than to select from a crowd who are impatiently waiting for honors. It would be impossible, even if one were so disposed, to derive personal advantages from an Association of this kind.

Having taken a cursory view of the past, we are now in a position to consider the present position, and also the prospects for the future. Gas managers' associations must, from their very nature, move with and accommodate themselves to the spirit of the day, if they are to be of any real use; otherwise they will speedily pass out of date. The next few years will be a time of trial for us; and it behooves the friends of this Association to consider the course that should be taken in order to maintain its vitality. The carrying out of our rules will suffice to do this; but unfortunately they are neglected in one very important, if not vital part. They are based on the assumption that every member is equally interested, and will be willing to take an equal share of the work. But the list of communications above referred to reveals the fact that, during the past nine years, only 21 out of 76 members have contributed papers to our proceedings. Some philosopher has remarked that brains are very unequally distributed; but I should be loth to think that the whole of the allowance belonging to the list of members is concentrated in the 21 gentlemen just instanced. I feel sure that many amongst the remaining 55 are equal to the work of maintaining the standard of our proceedings, and that they will not hesitate to do so, now that the matter has been squarely set before them. The 21 are, for the present, at any rate, almost pumped dry; so we must look to some of our hitherto silent friends to come forward and bring something that will help us out of the old time honored ruts into which we seem to have settled. The work of arranging the programme for the half-yearly meetings falls in a great degree upon your President and Secretary for the time being; and these officials have a right, according to the rules, to look for the support of the members. And unless a very large proportion are willing to accede to the requests for papers, or communications to be read at the meetings, the work of maintaining the proceedings must necessarily fall upon the devoted few; and the willing horses are worked too hard.

When district gas managers' associations were first introduced, it was thought that they might be utilized to some extent for educational purposes. They are quite equal to this object in a general way, for it is to be hoped that no meeting passes without at least one fresh fact or new suggestion being thrown out; but taking the word in its usual sense, as referring to the training of the coming generation, the subject is somewhat too large for us. A central or federated institution might possibly be capable of guiding and directing the 19th century fetish which we call Technical Education, in regard to our special industry; and this is but one of many questions that could only be efficiently dealt with by combination. Gas Associations in the United States are showing signs of concerted action in respect to questions of a general, as opposed to a local nature. Several gentlemen in England are beginning to see the advantages to be obtained by working in this direction, and I not only hope, but believe that this feeling will spread and grow stronger. With regard to the coming generation, I begin to think that the young, like the working classes, have plenty to look after their interests, and that the middle aged and the middle classes are equally in need of consideration, and therefore that a district association should direct its attention to the support and assistance of its members who have passed the preparatory course and are fairly embarked upon the ocean of business life, rather than to catering for a class of students.

In these days of special technical societies and classes, of chemical and engineering societies, of lectures, and of technical journals, there is danger of getting too much education rather than too little. It is possible to fail from knowing too much, as well as from knowing too little; and, indeed, we may question whether as many failures do not arise from the former as from the latter cause. With such a plethora of information before us, there is danger of becoming mere followers in the tracks made by others. We find there is a certain hedge to be jumped, and hang back till one or two bold ones have tried it, and then over we go in a crowd, and do not know what there is on the other side till we get there. We gather, from a magazine article or from a paper read at a meeting, that a certain system or process has proved successful in regard to one particular district. Information of this sort is necessarily more or less cursory and perfunctory. The novelty is described from one or two points of view only, and the defects are not made so prominent as the advantages, very often for the simple reason that they are not yet in evidence. If anyone doubts the truth of the line, "For things are not what they seem," let him take up a new process or system and attempt to make a practical success of it. Unexpected difficulties arise, necessitating the adoption of special methods for overcoming them. Things that look feasible on paper turn out quite differently in everyday work. And if the novelty eventually becomes a practical success, it shakes down into a different form from that at first contemplated.

The great defect of present day education is its tendency to superficiality. A solid and thorough, if narrow, sphere of knowledge is better than a wide and superficial one, and stands a greater chance of practical success; and the knowledge should not soar above or away from the subject to which it is applied, but be in close touch with it. With us, as sellers of gas, an intimate knowledge of our own particular patch of Tom Tiddler's ground, and the idiosyncrasies peculiar thereto, is indispensable for the successful application in practice for technical knowledge gained in other ways. In every district there are special local features that will not be gainsaid. There is certainly a very general family likeness between gas consumers in all parts of the world. The classical Greek, the stolid German, the polite Frenchman, the sturdy English, the cute Yankee, and the canny Scot, all agree that the gas meter is a wonderful machine that cannot by any possibility work too slowly; that the inspector is paid, like the income tax revisor and the assessment surveyor, a percentage on the amounts placed to the debit of the customer; that the price is too high and the quality too low; that the gas companies make excessive profits, and so on. But just as each member of a family has special individual characteristics, so every district of gas supply has its own peculiar features; and the most successful gas manager is the one who is capable of recognizing these, and working them to the best advantage.

This consideration is especially worthy the attention of our young and enthusiastic friends, who know no such word as "fail." Some believers in such a policy have spoilt their position in a new district beyond recovery by attempting to introduce radical changes before they had acquired a sufficient footing and influence with their new neighbors to insure the carrying through of the same. I should not be misunderstood as advocating a sit-still policy, in pressing for the exercise of foresight when introducing novelties either in the works or the district. The man who commences to build and is not able to finish is to be found in every town, and has existed in every age. The finishing touches of a painting call for more skill than the first outline, and the A B C of any subject is easier than the more advanced stages; and so it is a simple thing to initiate the introduction of a new system or process, but a different matter to make it a permanent success. It is one thing to avoid matters simply because they are new. If they are really worth having, the competent man will see his way to adopt them and carry them through to the goal of practical success. But it is another thing to stand still for a long time, and then to rush off at a tangent of mistaken activity in some direction or other, no matter where, under the idea of being enterprising and moving with the spirit of the times.

These considerations apply especially in the district represented here to day. As compared with other parts of the country, coals, ironwork, and almost all other necessaries are dear. Some of us are a hundred miles or more from the nearest foundry, and further still from the source of our coal. All our fireclay goods have to be brought from the North or Midlands. With the exception of the single item of labor, which is certainly cheaper than in factory districts, all our expenditure runs comparatively high; and, in addition to this, our undertakings are mostly small ones. Under such circumstances there is special need for a steady and cautious policy.

Now let me make a few remarks on the works which we have had the privilege and pleasure of showing you to-day. They do not present any

special points of novelty; and the general design of them has been more a matter of necessity than of deliberate choice. When you are told that the output now exceeds 80 million cubic feet per annum, you will gather that the weak point is the retort house and the coke yard, which are much too small for dealing in the best and most economical manner with a make of 300,000 feet per day, and upwards, such as we are called upon to provide during at least two months out of the year. Our next important extension will be a new retort house, of a capacity suited to the work which we require to do in it. We are also sadly deficient in the matter of coal storage room, as we found to our cost during the late coal panic. The annular condenser and scrubber are small, as compared with our maximum make; but with the help of a large foul main on the one side and a washer of ample capacity on the other, they are sufficient for our needs. My arrangements of foul and hydraulic main, tar overflows, etc., have been described before you on other occasions. Our retort settings are plain fours and fives, as the present retort house admits of no other sizes. They are also well suited to the kind of coal and the class of labor with which we have to deal. It is generally supposed that the use of solid fuel under retorts necessitates a waste in the direction of 50 per cent. excess air supply; but, by various modifications in the settings, dampers and chimneys, we have obtained much better results than this. With some of the later settings the excess of air supply is not greatly above that usual with gaseous fuel. There is a feed water heater in connection with the boiler, that condenses a very large proportion of our waste steam, raises the water to about 150° F. (which means an economy of nearly 10 per cent. in fuel), and enables us to keep the boilers going with screenings from the coke yard. It also acts as a partial purifier for the very hard water with which we have to deal, as a considerable quantity of chalk is deposited in the heater that would otherwise go into the boiler, and subsequently have to be cleaned out. It is a much simpler and easier matter to clean the heater than to scrape a boiler. We obtain a large supply of condensed water, which is stored for use in the washer. It is chemically more active than spring water, and leaves no chalky deposits either in the washer, the liquor well, or the sulphate boiler.

The purifier house arrangements include two independent sets of purifiers. One comprises four boxes, each 12 feet square, and the other two are 20 feet square. Either set can be worked first, second, or independently. They are overhead, and there is a hoist worked by a gas engine for raising the purifying material. We use both oxide and lime, and during the greater part of the year the whole of the sulphureted hydrogen is dealt with by one of the large boxes. Up to last winter we have used Westbury oxide exclusively; but last November, finding ourselves facing the winter's make with uncertain supplies of coal, some of which was very impure, we prepared for the worst by purchasing a cargo of the best Irish bog ore. In consequence the stock of oxide is at present unusually large. Although cottage property is close to our purifying house on two sides, we manage to steer clear of complaints as to nuisance.

The meter house arrangements are worthy of a special word. The house is not a large one, but it contains the meter, the valves for four holders, the two distributing governors, with all accessories. The arrangement is very compact and convenient, as the whole of the contents can be controlled without going out of doors.

We are now engaged in an important addition to our storage capacity, by the erection of a new holder and tank. The latter is of cast iron, 105 feet diameter by 25 feet deep; and the holder comprises two lifts, each 24 feet deep by 103 feet 3 inches, and 101 feet 6 inches diameter respectively. The nature of the the site is loose gravel covered with a thickness of four to five feet of soil and alluvial deposit, in which the water rises to a very short distance below the natural surface—a fact that prevented us from excavating to any great depth, and, indeed, caused us some trouble in regard to the work actually carried out. The top soil has been removed, exposing the gravel, all over the site, and a strong concrete foundation has been laid to recive the tank—the soil being retained on the ground to serve for banking up. The guide framing includes 14 wrought iron standards, supported upon short piers or blocks of concrete; and in the general design of the whole, strength and utility have been considered in preference to ornament. When the fact that this work was in contemplation became known, we were favored with particulars of the new systems for dispensing with guide framing, with which you are well acquainted. While not disputing the merits of these, we had regard to two facts. The first was that this apparatus is to be our sheet anchor, and therefore its reliability must be beyond suspicion; and the second was that our new capital, being sold by auction, could be raised at such a low rate of interest that the incurring of a reasonable extra expenditure in the securing of that end was not of great importance. Supposing that the saving secured by dispensing with guide framing was £1,000, the interest on that sum, at 4½ per cent., is £45 per annum; and this would not leave a large margin for alterations, repairs or other expenses that are usually incidental to novel arrangements.

We have exercised a judiciously liberal policy in dealing with our customers; and this may to some extent account for the fact that our sales of gas are remarkably good, as compared with the population of the district supplied, which is simply residential, and an agricultural centre. There are no large factories or industries of sufficient extent to influence the demand for gas. In this respect there is a general resemblance to other cathedral towns. The atmosphere is laden with a heavy and somnolent air of respectability, which discourages much in the way of business push and energy. But, notwithstanding these drawbacks, our output of gas averages over 5,000 cubic feet per head per annum—a figure that will compare very favorably with busy factory districts. We were among the first to adopt the system, now so general, of letting out gas stoves on hire; and we have further extended that plan to embrace any apparatus that is likely to induce additional business, with the exception of gas engines, which should preferably be the property of the user. Our present list of goods out on hire includes cooking stoves, gas fires, some 200 regenerator lamps, and various patterns of Sugg's street and shop lamps. Our day and summer consumption is good, and in common with others we find that the fluctuations of the thermometer exercise a great effect on the demand. The advent of a stiff frost in the winter at once increases our consumption some 10 to 20 per cent.

We have glanced at the affairs of our Association, and at the arrangements of the works here. Let us, thirdly and lastly, turn to the future of our industry. There is a large demand at the present time for sensation. People are fond of wild and startling speculations as to the possibilities of the future, and the self-dubbed prophets, who try to meet that demand, depend almost entirely upon imagination. They have tried this upon all sorts of things, the gas industry amongst the number, and for some reason or another which is not very obvious, these modern sibyls agree in regarding gas as a nuisance, and in rhapsodizing about a happy time when it shall be no more. Not only the ignorant, but also the scientific, who look upon gas managers as a sort of inferior caste, have been most unfortunate in their prognostications about our industry. Electricity is more to their taste, and gas has never, from the first, been popular in philosophical quarters. Sir Humphry Davy, one of the highest authorities of his day, who appropriated the credit of inventing the safety lamp after George Stevenson had made one, and risked his life in a fiery mine to prove the correctness of the principle, jeered at the idea of supplying gas. Later on, about 1877, gas companies were given a period of four years of grace in which to prepare, not for a "happy," but for a very effective dispatch. But gas has pursued the even tenor of its way, undisturbed either by the ignorant predictions of Mother Shiptons of the cat-and-broom style, or by the equally absurd and wild speculations that have been uttered over the lecture table by persons who are supposed to know what they are talking about.

Plain, practical foresight is the essence of successful gas managing; and it is frequently necessary to apply, not our imagination, but our judgment, as shaped by the personal experiences and the history of the past, to the exigencies of the future. Proceeding on these lines, the first thing we learn from the past is that the need for careful and skilful working becomes more and more evident every day. You are familiar with an illustrated advertisement entitled, "The child, what will he become?" as issued by a well-known firm of publishers, which affords much study and thought for parents and guardians. To some extent the child in that picture represents our industry; and "what it will become" depends upon ourselves. Having closely watched the history of gas affairs for the last 25 years, I have seen great changes of opinion and policy in the treatment of gas consumers. These changes have not been brought about by dread of competition, as is frequently stated, but have developed in an independent and natural way. There is a character in one of George Eliot's novels, who had such a keen insight into things that a knowledge of facts was a superfluity to him; and many of those who undertake to instruct the public on gas matters, appear to be of the same kidney. Twenty five years ago, the general practice in the matter of laying on new services was to charge the whole to the customer, and perhaps a fee for tapping the main as well. The only idea associated with gas fitting work was that of a substantial trade profit. Contrast this with the pushing policy of the present day. And the change has been effected apart from the pinch of competition, which very few of us have really felt. In my own case, I can only recall one instance in which the competition of other lights has entered into my calculations; and that was a few years back, when people began to want

larger and brighter lights than can be obtained from ordinary gas burners. This requirement was met by letting regenerator lamps on hire. Possibly some short-sighted shareholders are all the better for a little outside aid, in leading them to support a progressive and liberal policy; but the gas manager who knows his business does not need the ghastly glare of a 2000-candle (nominal French measurement) electric light, or the shout of the street hawker of "ile," as a stimulus to his business abilities. The policy that now generally finds favor with gas undertakings is not a new thing brought about by the circumstances of the day. It was inaugurated 50 years ago, and but for the successful examples, which are known to many of us, would not have come into general favor. It is not due so much to the startling effects of electricity or oil, as to the efforts of men whom we most rightly recognize as the pioneers of the gas industry. It behooves us to follow their footsteps, adopting every available improvement on the one hand, and strictly straightforward and honorable dealing with the various interests of consumers, shareholders and workers that are committed to our charge on the other.

As we look upon the multifarious and extensive range of duties that crowds upon us to-day, we are apt to wonder what on earth our predecessors of 40 years or so ago found to do. We have now to face not only retort, but generator, and other processes for making gas; to consider not only gas coal, but a wide range of solid and fluid hydrocarbons. There is the handling and transit of solid materials, tar firing, and sulphate making; the disposal, to the best advantage, of heaps of coke, which would have frightened the predecessor above mentioned out of his wits. We are expected to be intimately acquainted with a large variety of engines, burners, stoves and special technical appliances. With all this the *Journal of Gas Lighting*, like a hard-hearted Pharaoh, found us another duty a few weeks since. How truly we may take up the words of an American writer, and say that, although we call ourselves gas engineers, the whole of our time is devoted to these incidental matters, and that none is left for the primary object of finding out the best and cheapest ways of making and supplying gas. It is mistaken economy when a manager, though actuated by the praiseworthy object of economising in the item of salaries, undertakes so much of the detail work that he has not time to continually watch and check the daily working results. He is simply taking care of the pence at the office table, while the £5 notes are blowing out of window in the works and district. Even in a moderate sized works, it is necessary, if all the details above instanced are to be properly and effectively administered, that the mere routine and detail work should be performed by subordinates—leaving the responsible manager free to grasp the reins and guide the course of the whole. In our large railway undertakings, there are departments, each in the charge of a responsible foreman or superintendent, under the general care of the manager; so in a gas works the manufacture and purification, the distribution, the sale of residuals, the hiring of meters and fittings, may be appropriately divided up according to the extent of the business. The accounts office, the drawing office, and the laboratory should be worked as separate departments, but all subordinate to one general control.

But I have much sympathy with the writer in the *Journal*, who points out the necessity for giving to the public some accurate statements on the subject of gas supply and consumption, by way of correcting the numerous erroneous ideas that prevail. Some of these have originated amongst persons interested in other forms of lighting; but a great many of them are due to the exclusiveness of gas undertakings, which do not come so much in touch with their customers as they ought to do. In the majority of instances, the consumer knows no one connected with the company beyond the meter inspector and the collector, both of whom have a certain number of visits to get through in a day, and therefore are not inclined, even if they are competent, to discuss matters of gas supply and consumption. The consumers should be encouraged to call at the office, and inquire as to any matters respecting their accounts, their supply of gas, or the best ways of using various gas appliances. They should be received by a responsible representative, who has leisure to attend to them, and is fully competent to explain matters clearly and lucidly. In many of our small towns, the personality of the manager, or of the directors, goes some way towards breaking down these feelings of exclusiveness. Various ways of working in this direction will suggest themselves. One is to post the public up in your doings, by keeping them informed of them. See that a full account of your half-yearly meetings appears in the local press. This is a sure way of securing the support and sympathy of the more thoughtful class of consumers. As opportunity offers, show the customers round the works. A little friendly attention in this way is always received with appreciation. Another way of keeping in touch with the public is by judicious advertising. If it pays a tradesman to keep his commodities before the public eye, why should it not be a wise plan for a gas company to do so. Get up lectures and exhibitions when you see there is a need for them, but not before. A little work on these lines will render the ridiculous notions about exorbitant profits, injurious effects of gas, and other things that grow with repetition, much less prevalent than they are at present.

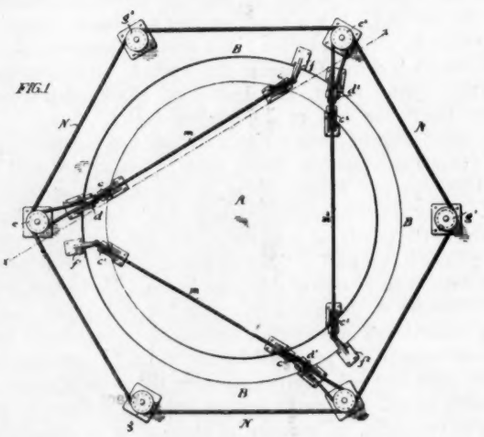
Now it only remains for me to thank you for your kind attention, and to ask you to accord our friends who are helping us by contributing to the proceedings to day, an appreciative and also a critical hearing, and then, when the time comes, to stand up promptly and boldly, like Englishmen, and take part in the discussions.

Wood's Improvement in Gasometer Construction.

On March 27 U. S. Letters Patent (No. 517,254) were granted to Mr. Walter Wood, of Philadelphia, Pa., for improvements in gasometer construction. Using the words of the specification:

My invention relates to certain improvements in devices for guiding and controlling the rise and fall of the gasholder in its tank, by means of ropes or their equivalent passing around the holder and so arranged as to insure the absolutely vertical translation of the holder, without the use of any fixed columns or standards or frame work; and has especial reference to such an arrangement of the ropes that this result may be obtained without the necessity of any of the ropes having their anchoring point beneath the surface of the water in the tank.

In the drawings, Fig. 1 is a plan view of a holder with the ropes arranged according to my invention. Fig. 2 is a vertical section through



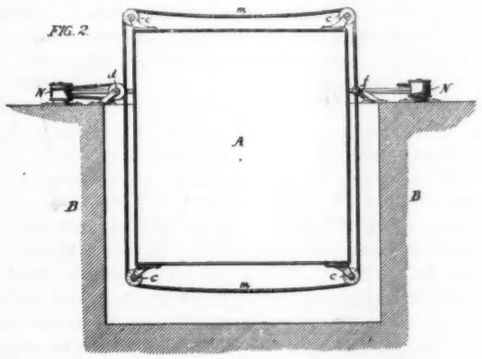
x x, Fig. 1. Fig. 3 is a diagrammatic view, showing the arrangement of certain of the ropes.

A is a gasholder of the usual construction, B is the tank containing water or other liquid, within which the holder rises and falls. At the four corners of the holder which are presented by the section, Fig. 2, are mounted four pulleys, c, c, c, c. A rope m passes in a vertical plane freely around these four pulleys, and consequently around a portion of the gasholder. Upon the edge of the tank at one side of the holder, where the rope m passes from top to bottom of the same, is fixed the clamp f, and to it the rope, although continuous, is clamped. Upon the other side, where the rope passes the edge of the tank, is mounted the vertical roller d. The end of the rope m which comes from above passes under this roller, and the end which comes from below passes over it. From this roller these ends are carried away from the holder and pass each around an opposite side of the large horizontal roller e. This roller e is one of a series, e, g, e^1 g^1, e^2, g^2, mounted at intervals around the outside of the tank, and around which there passes an endless rope N. It has a broad enough rim to carry three ropes, and in addition to the rope N the two ends of the rope m are carried around it in different directions. Each of these ends after passing around this roller is carried each in the opposite direction, alongside of the rope N, and after a sufficient distance is made fast to it. This distance must be sufficient to allow to each of the ends of the rope m at least an amount of play equaling double the amount of the possible vertical motion of the holder. The distinction between these extended ropes and the rope N is not seen in Fig. 1, as the ropes are in the same vertical plane. In Fig. 3 a portion of the rope N, adjacent to one of the pulleys e, is shown in vertical elevation, both ends being continued dia-

grammatically in the same plane. In this figure the arrangement of the ends of the rope m, passing around the pulleys d and e, and then alongside of the rope N, until they are fastened thereto, is clearly shown.

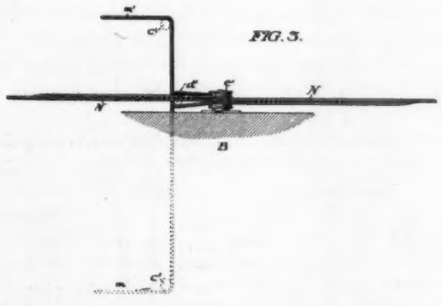
In the drawings Fig. 1, three ropes m, m^1, m^2, are shown, each of which is arranged precisely as the rope m, which has just been described. The number of these ropes is immaterial, it being only necessary to have at least three. They may also be arranged in any desired way, with the limitations that they must lie in at least three non-parallel planes, and also that they must not all cross each other at the axis of the cylinder. If these limitations were not observed it is obvious that the holder would have a possible motion of rotation within the ropes and without reference to them—a motion which it is the object of my device to avoid.

FIG. 2.



The operation of the device is as follows: As the gas passes into the holder, tending to cause it to rise, the upper half of the rope m draws an amount of rope equaling double the amount of the rise of the holder from around the roller e, causing an equal amount of rotation of the endless rope N, at the same time the lower half of the rope m pays out an equal amount, which is taken up by the revolution of the rope N. As all parts of the rope N move simultaneously, and as all the ropes m, m^1, m^2 are attached to it, the same amount is taken up from the bottom of the ropes m^1, m^2, at the same time, and an equal amount let out from their tops. This necessitates the equal rise and fall of the three sections controlled by the ropes m, m^1, m^2, at the same time, and necessitates the absolutely vertical translation of the holder, which is the object to be attained. There are two distinct advantages to be found in this arrangement; first, as the rope m passes entirely around the holder, the strain upon this rope at any one place is equalized throughout its entire circuit; second, the rope has no anchoring point below the surface of the water. Both the entire inner surface of the tank and the lower rim of the holder are necessarily never above water. If, then, there is any point of attachment at these places, and a break or loosening of the rope there attached occurs, great difficulty must be experienced in repairing it and refastening the rope to a point below water. In the present arrangement this difficulty is entirely absent, and even though the rope m should break, it could readily be replaced by lowering the loop of a rope down the side of the tank and adjusting it under the pulleys c c under the tank by a forked stick.

FIG. 3.



A very simple modification of my device consists in omitting the clamp f, and putting in its place another roller d, and otherwise precisely re-duplicating upon the right hand side of the drawings, Fig. 2, the arrangement shown upon the left hand side. In this case the movement of the rope m is taken up simultaneously at both sides and transferred to the endless rope N, instead of all the motion being taken up at one side. The result is that instead of the amount of motion taken up from the rope m on one side equaling twice the amount of the vertical motion of the holder, as is the case in the form of device first described, the amount taken up upon each side precisely equals the amount of the motion of the holder.

Another very simple modification of the device shown in Fig. 2 consists in omitting that portion of the rope N which is between the points of attachment of the two ends of m, thus in effect making the ropes m, m^1, m^2 continuous, or in other words reducing all the ropes to one. As in Fig. 1 the points of attachment of the ropes m, m^1, m^2 to the rope N are not shown, it may be taken also to represent this modification. As such the course of the single rope would be as follows: Commencing at the clamp f, the rope passes up over the upper pulleys c c, thence down under d, thence around e, g, e^1, thence over d^1, thence down under the lower pulleys c^1, c^1 (not shown), thence up through the clamp f^1, thence up over the upper pulleys c^1, c^1, thence down under d^1, thence around e^1, g^1, e^2, thence over d^2, thence down under the lower pulleys c^2, c^2 (not shown), thence up through the clamp f^2, thence up over the upper pulleys c^2, c^2, thence down under d^2, thence around e^2, g^2, e, thence over d, thence down under the lower pulleys c, c (not shown), thence up to the clamp f.

Throughout this specification the word "ropes" has been used as including either ordinary ropes, wire ropes or chains.

London Coal Gas and Its Enrichment.

[A paper read by Prof. V. B. Lewes before the Society of Arts.]

Although the first centenary of coal gas was celebrated two years ago, another thirteen will have to elapse before we can commemorate the completion of the first hundred years of its practical use in London as an illuminating agent, and as the past few years mark a distinct epoch in the history of the gas industry, and as the air is full of changes yet to come, I propose to bring before you in this paper, in as brief a space as possible, a history of the past, as far as it concerns our great city, and a review of the present condition of our gas supply from the point of view most likely to interest the consumer. In doing this I shall restrict myself, as far as possible, to the area in which I am most interested, that is, the city of London, but it must be borne in mind that the largest proportion of the metropolitan district north of the Thames is supplied by the same great Company that supplies the city, and that most of my remarks will apply equally well to the gas supplied to the district south of the Thames by the South Metropolitan Gas Company, and also to the portion of Northeast London supplied by the Commercial Gas Company.

The first mention of any gas lighting in the city was in 1807, when an experiment was made in lighting part of Whitecross street and Beech street with gas, and this having proved successful, the Chartered Gas Company obtained the first gas act in 1810, granted by Royal Charter, hence their name "Chartered," their lighting powers extending to the city of London, Westminster and borough of Southwark.

In 1814, mains were for the first time laid in the city, and on the 9th of November, 1815, the Guildhall was illuminated by gas. In that year, also, the Chartered Company entered into a contract with the Commissioners of Sewers to light several streets in the wards of Cornhill and Cripplegate.

After a lapse of seven years, the City of London Gas Company was formed, and obtained a gas act, in 1817, to light very nearly the same area.

Up to 1823, the two Companies having powers over practically the same area, there was keen competition between them, but in 1822, Sir W. Congreve, who had been appointed, on behalf of the Crown, to inquire into the gas supply of the metropolis, advised that districts should be assigned to the Companies, and although this was keenly opposed by them, an act was passed in 1823 carrying his recommendation into effect. The city was then divided between the City of London Gas Company and the Chartered Company, the City Company having that portion which comprises the western and southern part of the city as bounded by Aldersgate street, Cheapside and Fenchurch street, whilst the Chartered Company supplied the portion comprising the northern and eastern part of the city. This arrangement, of course, put an end to competition between the two Companies, and left the gas supply as a monopoly in their hands.

The representatives of the Companies had to appear annually before the corporation to tender for lighting the streets, but, as there was no alternative between accepting their tenders or returning to oil lamps for city illumination, this had but little effect upon the price which the Company was able to charge for gas. At these meetings it was the custom to draw the attention of the Companies to the reduction in the

price of gas which competition was effecting in the districts surrounding the city, and it was then that the Companies announced their intention of reducing or retaining the price of gas to the citizens during the ensuing year.

In 1825, the price of gas was 15s. per 1,000 cubic feet, but, by gradual reductions, it had fallen to 7s., in 1844, and after much agitation it was further reduced, in 1847, to 6s. per 1,000 cubic feet. Dissatisfaction, however, continued to be felt at this price, as it was contended, by experts in the subject, that the city was entitled to a much greater reduction, and that, owing to the large consumption concentrated into a small area, it was entitled to gas at a lower price than any other portion of the metropolis, and the Gas Companies were informed that, if competition were offered, it might be accepted by the corporation, unless further reduction in the price of the gas was at once made. The price suggested by the Corporation Committee as being an equitable one was 4s. per 1,000, and the Companies were required to state whether they would, by gradual reductions, or within a reasonable period, lower the price to this figure per 1,000 cubic feet. This the Companies positively and definitely refused to do, stating that it would be impossible to supply gas profitably at that price; and they further declined to give any guarantee that it would be reduced below 6s.; and it was this refusal that first led to the organization of the Great Central Gas Consumers' Company. The promoters of this Company started with the proposition that the city was, from its local conditions, entitled to have gas at a cheaper rate than the rest of London; and they also, under the advice of skilled experts, averred that a price of 4s. per 1,000 cubic feet would be largely remunerative to the Company; and, being supported by a numerous and influential body of citizens and gas consumers, and being further supported by the corporation, they applied to Parliament for an act in 1849, and again in 1850, but their application was unsuccessful on both occasions. In 1849, however, they had applied to the corporation for permission to put down pipes in the city, and had offered to execute a deed, by which they bound themselves to supply gas to the consumers at a price never to exceed 4s. per 1,000 cubic feet; and further, to reduce the price to 3s. 6d. and 3s., whenever they could pay a dividend of 10 per cent. to their proprietors, the then City Solicitor, Charles Pearson, and Alexander Angus Croll, at one time Engineer to the Chartered Gas Company's Brick Lane station, being the chief promoters.

The Commissioners of Sewers, relying upon the promises made, accepted the offer, and a deed, dated February 12, 1850, between the Great Central Gas Consumers' Company and the Commissioners of Sewers was accordingly executed for carrying out the arrangement. The promoters were allowed to lay down pipes, and, with the large influence they had acquired, they applied for and gained an act of incorporation as the Great Central Gas Consumers' Company, and in 1851 also entered into their first contract for public lighting.

As soon as the Great Central Gas Consumers' Company was formed, in 1849, the other Companies, stimulated by fear of competition, at once reduced the price of gas to 4s., but the Commissioners of Sewers feeling, from the attitude which the Gas Companies had taken before competition had been suggested, that it was only by keeping up the competition that the price could be kept down, supported the new Company on the understanding that 4s. per 1,000 cubic feet would be henceforth the maximum price of gas in the city, which price might still further be ultimately reduced, and the compact entered into with the Company was subsequently incorporated in the Company's act of 1851, the result being that the citizens had gas supplied to them at 4s. per 1,000 cubic feet until the passing of the Metropolis Gas Act in 1860.

About the year 1857, when the northern companies settled their several districts, the gas companies surrounding the city combined, with a view of stopping competition, and in view of the opposition received from delegates from various local boards in the metropolis, who were defending the public interest against the coalition, parliamentary committees were appointed, in the years 1858–59, to inquire into the gas supply of the metropolis, and, as a result of their labors, the Metropolis Gas Act was passed in 1860. The bill was introduced into Parliament in April 1860, and was referred to a special committee in the House of Commons, who, after hearing a considerable amount of evidence, arrived at certain decisions which were apparently so favorable to the public and so distasteful to the gas companies that they withdrew their representatives altogether from the committee, which concluded its labors on the 25th of June. The gas companies meanwhile employed themselves in raising opposition to the bill on its third reading, and succeeded in obtaining its recommittal; and finally, the gas companies having obtained the withdrawal from it of those features which they considered objectionable to their interests, the act ultimately passed.

In 1861, the three companies supplying the city raised the price of gas to 4s. 6d., and the Commissioners of Sewers, who had been relying upon their agreement with the Great Central Gas Consumers' Company, took counsel's opinion as to their being able to increase the price, and a special case was argued before the Court of Common Pleas in 1862, and decided in the companies' favor, this judgment being confirmed upon appeal.

By the act of 1860, the price of ordinary gas was fixed at a maximum of 4s. 6d., with power to the Home Secretary to grant an increase up to a limit of 5s. 6d., should the necessity arise. After the passing of this act, the affairs of the gas companies became very prosperous, and in 1866 the corporation promoted a bill to construct gas works, and to supply gas in competition with the three companies supplying the city, but after a fortnight's inquiry it was rejected by a Select Committee. There was another parliamentary inquiry in 1867, and in 1868 a bill was introduced for amending the Metropolis Gas Act of 1860. This act passed and the corporation acquired the power of purchasing by consent the undertakings of the gas companies supplying the city, a power which they never exercised. The companies on their part obtained power by this act to amalgamate, and were compelled after two years to raise the illuminating value of their gas to 16 candles, and reduce the price to 3s. 8d. per 1,000 cubic feet, subject to going to the Board of Trade for a revision of price should it be necessary to maintain the dividends. In 1873 and 1874 the Imperial and Chartered Companies succeeded in establishing a claim for increase in price up to 5s., under the revision clauses of the act of 1868, as the coal famine of the preceding years had caused a considerable increase in their working expenses. Up to 1870, the supply of gas to the metropolis was furnished by 13 companies, but between 1870 and 1876 six of these—the City of London, Great Central, Equitable, the Western, Imperial, and Independent—all amalgamated with the Chartered Company under the title of the Gas Light and Coke Company, and they, together with the Commercial Gas Company, now supply the whole of London north of the Thames.

At this time the South Metropolitan Gas Company was selling its gas at 3s. per 1,000, and at the instigation of the city authorities an inquiry was held by a strong parliamentary committee, presided over by the late Right Hon. W. E. Forster, which occupied a month in 1875, and before which Mr. George Livesey gave evidence, and suggested identifying the interests of the consumers and the companies by an arrangement now known as the "sliding scale." The principle suggested was approved by the Board of Trade, and it was incorporated in the acts obtained by the Gas Light and Coke and South Metropolitan Companies in 1876.

By the Gas Light and Coke Company's Act of 1876, the price of 16 candle gas was fixed at 3s. 9d. per 1,000, and the dividend at 10 per cent., which might be varied, subject to an increase or decrease in the price of gas, to be calculated as follows: For every penny or part of a penny charged in excess or diminution of the standard price the rate of dividend might be increased or diminished by 5s. per £100 per annum, this principle being known as the "sliding scale," and as at present the price of gas has been reduced by 8d., the dividend payable by the Company is 12 per cent. Provision was also made as to the application of excess of profits over the standard rate of dividend, and that all new capital should be sold by auction or tender, and this arrangement remains in force down to the present time, as the Gas Light and Coke Company's and other Gas Companies' Acts Amendment Act passed in 1880 only dealt with regulations of the supply of gas and its purity. The changes in the price of coal gas supplied to the city will be found in the following table:

Table Showing the Price of Gas Supplied to the City during the Undermentioned Years.

Year.	Rate per 1,000 Cubic Feet. s.	d.	Year.	Rate per 1,000 Cubic Feet. s.	d.	Year.	Rate per 1,000 Cubic Feet. s.	d.
1826	15	0	1855	4	0	1875	3	9
1834	10	0	1856	4	0	1876	3	9
1837	9	0	1857	4	0	1877	3	6
1838	9	0	1858	4	0	1878	3	6
1839	9	0	1859	4	0	1879	3	6
1840	9	0	1860	4	0	1880	3	4
1841	9	0	1861	4	0	1881	3	2
1842	9	0	1862	4	6	1882	3	2
1843	9	0	1863	4	6	1883	3	2
1844	8	0	1864	4	6	1884	3	0
1845	7	0	1865	4	6	1885	3	0
1846	7	0	1866	4	0	1886	3	0
1847	7	0	1867	4	0	1887	3	0
1848	7	0	1868	4	0	1888	2	9
1849	6	0	1869	4	0	1889	2	6
1850	5	0	1870	3	9	1890	2	9
1851	4	0	1871	3	9	1891	2	9
1852	4	0	1872	3	9	1892	3	1
1853	4	0	1873	4	4	1893	3	1
1854	4	0	1874	5	0	1894	3	1

Having now traced the history of the city gas supply and the changes in price which it has undergone, we will turn to the gas itself, and see what variations have been taking place during the past 40 years in its illuminating power and composition. Ever since Bouguer introduced the idea of expressing the illuminating power of illuminants as being of so many candles value, this unit of light has been employed, and under certain defined conditions the London gas supply has to emit a light equal to 16 sperm candles of the size known as "sixes," and consuming the sperm at a rate of 120 grains per hour.

The amount of light emitted by a gas flame is entirely dependent upon the form of burner by which it is consumed; and the variations which have taken place in the standard burners employed for gas testing have given rise to the idea that the quality of gas supplied by the metropolitan companies is far higher than it was 40 years ago; but when we come to carefully examine into this subject, we find that this is purely fallacious.

Up to 1850 but little attention was paid to the illuminating value of the coal gas supplied to the metropolis, but in that year a bill was passed which enacted that the light emitted by a brass argand burner with 15 holes, consuming 5 cubic feet of gas per hour, should be equal to the light of 12 wax candles, of the size known as "sixes." These wax candles were, however, only equal in illuminating power to 10.3 of the sperm candles at present used for testing purposes, so that when, in 1860, an Act changed the illuminating power to 12 sperm candles, it meant an increase of 16.5 per cent. in the illuminating value of the gas; and, in 1868, this was again raised to 14 candles, and by the Act of 1876 this was increased to 16 candles, and remains so to the present time.

To the uninitiated, this gives the comforting reflection that, although the price of gas has been falling, we are being supplied with a quality which emits 55.3 per cent. more light than the gas sent out from the works in the years immediately following the passing of the Act of 1850; but when we examine the changes which have also taken place in the methods by which the gas has been consumed for testing purposes, we find that, although we have this large nominal increase in illuminating value, the actual light obtained by the consumer remains the same.

In 1864, the 15-hole brass argand was discarded as a standard testing burner, and was replaced by a 15-hole steatite burner, which, by increasing the temperature of the flame, developed 11 per cent. more light; whilst in 1869 the "London argand" 24 hole burner was introduced, and gave a still further increase in the light obtained from the gas amounting to over 17 per cent., and if we translate the light emitted from the gas sent out by the Chartered and Great Central Gas Companies in the years from 1852 to 1863, from terms of the old 15-hole brass burner, into the light which would have been emitted by the burner we use to-day, we find that the results are practically identical.

	Standard Burner.		
Year.	Brass 15-hole Argand.	Steatite 15-hole Argand.	London Argand.
1854	12.72	—	16.39
1868	—	14.09	16.34
1894	—	—	16.60

And when leaving the photometric side of the question, we approach the purely chemical aspect, we find no change has taken place in the composition of the gas which would lead us to expect any great alteration in its illuminating value.

Composition of Gas Supplied to the City.

	1851.	1876.	1884.	1894.
Hydrogen	51.81	50.28	47.99	53.36
Saturated hydrocarbons	35.25	36.95	37.64	32.69
Unsaturated hydrocarbons	3.53	3.22	4.41	3.58
Carbon monoxide	8.95	4.37	3.75	7.05
Carbon dioxide	nil	nil	nil	0.61
Oxygen	0.08	0.22	0.26	0.21
Nitrogen	0.38	4.96	5.95	2.50
	100.00	100.00	100.00	100.00

Analysts—E. Frankland, Humpidge, P. Frankland, and Lewes.

On examining these analyses we see, however, a distinct change has taken place in the proportions in which certain constituents of the gas exist. The constituents of coal gas may be divided into three classes—(*a*) Those which give the illuminating properties to the flame; (*b*) the combustible diluents, which give size and body to the flame; (*c*) impurities, which are generally as small in quantity as they can in practice be obtained.

In the above table, the hydrocarbons, upon which the luminosity of the flame mostly depends, belong to the class which we term unsaturated hydrocarbons, whilst the combustible diluents consist of the saturated hydrocarbon methane, hydrogen, and carbon monoxide. On examining the analyses of the Gas Light and Coke Company's gas made in 1884 by Dr. Percy Frankland, and one made this year by myself, it will be seen that the hydrogen is nearly 6 per cent. higher, the carbon monoxide over 3 per cent. higher, and the saturated hydrocarbons 5 per cent. lower than they were 10 years ago, and although this has no practical effect upon the illuminating power, this change in composition has brought about a curious phenomenon with regard to the size of the flame.

A year ago my attention was called to the fact, that many consumers of gas within the city were noticing a considerable increase in their gas bills, with no corresponding increase in the number of burners in use, or in the hours during which the gas was consumed; and I was instructed by the Corporation Committee for County Purposes if possible to find the cause for this. In several cases there was nothing to give any clue as to the reason for this phenomenon, as the meters had been regularly tested, no alteration made in the number or form of burner used, and the gas had been consumed for exactly the same hours as before, and yet the consumption had been steadily increasing during the past three years.

After endeavors—for some time in vain—to find the cause of this, I at length made an extended series of experiments upon the composition of the gas and the height of flame which it yielded, and found that up to three years ago, the flame emitted by a standard London Argand, when burning a 16 candle coal gas, at the rate of five cubic feet an hour, was exactly three inches, but that since that time the height of flame necessary to emit that amount of light had been steadily growing less, and at the present moment a 16 candle flame in the London Argand has a height of only 2.6 inches.

The cause of this is that the height of a flame entirely depends upon the constituents of the gas, and whereas hydrogen gives an excessively short flame, methane, or marsh gas, will give a flame more than four times as long, when burning at an equal rate of flow, the flame yielded by carbon monoxide being intermediate in size between the two.

Height of Flame Yielded by Gases Burning at the Rate of Five Cubic Feet per Hour in London Argand.

Gas.	Inches.
Hydrogen	0.985
Carbon monoxide	2.206
Methane	4.25

It is, therefore, evident, that the alteration in composition, due to the increase in the quantity of hydrogen and carbon monoxide, and the decrease in percentage of methane, has led to this alteration in the size of the flame.

When a householder lights his gas burners, he invariably turns on the gas until he gets the largest possible flame without roaring or smoking, and, from the alteration in the composition of the gas which has taken place, this means using far larger quantities of gas than heretofore, so that, although an increase in illuminating power is obtained, a substantial increase in the quarter's gas bill is also found.

[To be continued.]

Mr. Humphreys' Retirement from Service with the United Gas Improvement Company.

At the Sixth Annual Meeting of Superintendents, Engineers and Agents connected with the United Gas Improvement Company, held in the city of Philadelphia, April 17 to 21, 1894, Mr. Alexander C. Humphreys, General Superintendent, made the following announcement:

Gentlemen: I have an announcement to make before adjourning, and I will ask that the adjournment be had immediately after the completion of this announcement. I make it with deep regret. It is particularly hard to make it to this assembly, for looking in your faces I am prevented from forgetting for a moment my chief cause for regret in this connection.

As you gentlemen know, some years ago, under the strain of my work, my health gave way. While I have been fortunate enough to regain in a large measure my former strength, I still find that care must be observed if my strength is not to be again overtaxed. No matter how anxious I may be to continue in this Company's service, the preservation of my health must be first thought of. I am finally convinced that I stand a better chance of preserving my health if I lay down the very grave responsibilities of my present position, even if I have to take up other responsibilities. I have, therefore, after careful consideration, tendered my resignation to the Company, to take effect August 1st, and it has been accepted, and I believe, with regret. I am gratified that the Company has requested *me* to make this announcement to you.

It may not be inappropriate for me to refer in a few words to my future work. Naturally, curiosity will be excited, and it is well, perhaps, that the facts should be given out by me. I am also sure that those listening to me will be honestly interested in learning of my proposed future movements.

It is known that the firm of Humphreys & Glasgow has for some time been established in England. The firm has there met with a fair measure of success.

It is my intention to go over and spend with Mr. Glasgow so many months as may be necessary to complete the organization of the business so well begun by him. It is almost unfair that I should so long have left this task entirely to my very able partner.

I expect then to return to this country and start an office of the firm of Humphreys & Glasgow on this side, probably locating in New York City. While in England our business is water gas plant construction, here it will be a general gas engineering business. While in water gas construction there will be a tendency to meet my old Company in competition, the good feeling existing on both sides will, I believe, tend to reduce the competition element to a minimum.

It is almost beyond me to even attempt to refer to my feelings in thus deciding to break the old ties. This is the tenth year of my services with the United Gas Improvement Company, and in that ten years friendships have been made which I hope will last as long as life lasts. I can look back with pride, and perhaps honest pride, upon the work performed and the progress made in the Company's service. But I can with entire candor say that there is no one feature of my work of which I feel *so* proud as of my success in gathering around me and retaining as my assistants the men who now report to me.

I thank you, gentlemen, and I thank those who are not now within sound of my voice, for having supported me so well in the arduous task of development and execution which has here fallen to my lot to perform.

And this brings me naturally to the question of my succession. I bespeak for those who will take up my work your hearty co operation. It is a great satisfaction to me that our organization is in such good shape to move along without me. It has been my earnest endeavor from the first to develop an organization which would not be dependent for its efficiency upon any one man. I believe that the facts are about to prove that in that direction at least I have been most successful.

Mr. Clark will, of course, be made General Superintendent. He has, however, requested that some of the responsibility I have carried he be permitted to decline. *He*, also, must carefully consider the question of his health. He feels, and I fully agree with him, that he could not safely take up the full burden as I lay it down. Therefore, he will be responsible only for the duties strictly pertaining to the General Superintendent's department, including the construction of plant and the manufacture and distribution of gas. He will be a member of the Works Committee, with the President, General Manager and General Counsel.

Mr. Lillie will, as now, have immediate charge of the commercial end of the operating branch of the business, but instead of reporting to the General Superintendent, he will report direct to the General Manager.

The sales department will be looked out for by Mr. Shelton, but Mr Shelton also will report direct to the General Manager—Mr. Clark, General Superintendent, of course having the final voice as to the engineering points involved in the sales department's work.

This is a brief outline of the changes contemplated. It can be readily seen that the result will be such a relief in the matter of responsibility and work falling upon the General Superintendent that it is not contemplated to at present make any promotion to the office of Assistant General Superintendent.

This course is still less necessary on account of the personnel of the present staff. Mr. Clark will be in chief assisted by Mr. Serrill, who will, as now, look out for the routine of the department, and by Mr. Roberts, who will, as now, have immediate charge of construction. Mr. Roberts and Mr. Serrill will thus assist Mr. Clark while holding equal rank.

Messrs. Collins, Norris and Wright will continue to assist as Inspectors of their several branches, and Mr. Page will give special attention, for the present at least, to the development of business through the instrumentality of gas appliances. The details will be properly made known to you before August 1st.

Before closing these remarks let me express the hope that the work with which I have been so long and so intimately connected will go along in a way to satisfy the re-arranged general management. In Mr. Clark and Mr. Lillie you will have two chiefs who will always expect the best possible results, but who will at the same time be just and reasonable. In these two gentlemen you will find always present the desire to have the Company's affairs pleasantly administered, if possible.

* * * * * * * * * *

While the present seemed an opportune time for this announcement, the fact that I have yet some months of service with the Old United Gas Improvement Company renders it unnecessary for me at this time to say good-bye; and this I am thankful for.

Even when the time for this partial separation comes, I shall be glad to feel that my life's work is to continue, to a certain extent at least, in your midst. When I hear of the good work being done in the old United Gas Improvement Company's service, I shall remember with pride that it is to my former associates that the credit is largely due.

It has always been a great pleasure to me to come in close personal contact with our representatives abroad. Of late my increasing duties have more and more prevented me from meeting you at your several stations as much as of old. I have, therefore, enjoyed the more these meetings. I feel that these meetings have been of great profit to our Company. I hope they have been so to you, and I know they have been so to me. I trust also that the pleasure I have obtained from them has been also enjoyed by you. It is deeply gratifying to me that this, the last meeting at which it will my pleasure and honor to preside, has been so successful, and has marked plainly another step in advance made in our system of united management.

From the bottom of my heart I wish you severally and collectively all possible success.

The attendants at the meeting later appointed a commitee to draft and present resolutions expressive of the feeling of Mr. Humphrey's associates. This committee reported the following day just before the final adjournment, as shown in the following extract from the stenographic report:

EXTRACT FROM STENOGRAPHIC REPORT.

Mr. Keppelman—I would ask that the meeting be turned over to Mr. Clark for a few minutes. [Mr. Clark takes the Chair.] Mr. Chairman, the Special Committee appointed is ready to make its report, and with the sanction of the chair I will proceed to read it:

"Sixth Annual Meeting of Superintendents of the United Gas Improvement Company, Philadelphia, April 21, 1894.

"*Whereas*, Alexander C. Humphreys, General Superintendent of the United Gas Improvement Company, has, at this meeting of Superintendents, Engineers and other employees assembled, announced his resignation and withdrawal from the service of the Company; and

"*Whereas*, This announcement is received by us with profound and heartfelt regret, it is herewith

"*Resolved*, That this occasion be taken to express to Mr. Humphreys our deep regret at the severance of the present relations; that we herewith convey to him the expression of our admiration, esteem and affection for him as a man, and that we extend to him our heartfelt wishes for his succes in whatever lines of work he may hereafter engage.

"To the building up of a business to be carried out on lines that were a departure from existing precedents, there was required a man of unusual foresight, ability and clearness of purpose. In the development of the United Gas Improvement Company, under Mr. Humphreys, we recognize the logical outcome of such ability and the work of a natural leader and of a manager foremost in his profession, and we believe that the working organization that he has perfected stands to day the best and most enduring monument to his labors.

"A conscientious worker, rarely skilled in his profession, indefatigable and earnest in purpose, he, more largely than has any other one person, has been the factor that has brought the United Gas Improvement Company to its present enviable position in the gas world; to a point wherein its integrity, rank and purpose is recognized; and where connection with it is an honor to every man of us here assembled.

"But while we recognize, as above, the business ability of Mr. Humphrey's, there is yet a deeper and a sweeter attraction that draws us all to him, and that makes the pain of losing him the greater, and that is his integrity, his individuality, his personality and his magnetism as a man. Rarely, indeed, is seen a man so conscientious in his effort to meet his responsibility to his employers; so keenly appreciative of earnest work; so impartial in his judgment; so constant and so successful in the effort to act with fairness to all. Of no man can it more truly be said, 'he is a man of honor, integrity and justice.'

"To the younger men of us his example is one for admiration and inspiration, showing the possibilities of a man. To the older man here assembled, who have known him during years of association and of

ever increasing respect, there is but admiration at his unswerving adherence to his principles and belief; for his constant kindliness, his daily living of the Golden Rule. In his new fields of labor the united good wishes of this assembly go out to him for his success, joined with the earnest hope for continuance to him of good health.

"Again, in losing him, we express the unanimous, profound and heartfelt regret of every man among us, for in working with him we have learned to love him. It is further

"*Resolved*, That a suitable and permanent copy of this preamble and resolution be prepared and transmitted to Mr. Humphreys in commemoration of this occasion.

"I move the adoption of the resolution.

"J. H. KEPPLEMAN, Chairman."

The motion was seconded in terms expressive of the general feeling of affection and respect in which Mr. Humphreys is held by his associates, by Mr. W. L. Williams, of Paterson, N. J., speaking for the older employees outside of the Philadelphia office, Mr. Alten S. Miller, of Chicago, and Mr. J. M. Daniels, of Columbia, speaking for the younger men outside of the Philadelphia office, Mr. C. R. Collins, Mr. F. H. Shelton, Mr. W. J. Serrill and Mr. Lewis Lillie, speaking for the employees in the several branches of Mr. Humphreys' department in the Philadelphia office, and by Mr. S. T. Bodine, General Manager, who spoke as follows:

My lips are often dumbest when my heart speaks loudest. No one knows this better than my very dear friend, Alexander C. Humphreys. The beautiful and touching words in which your committee have expressed our feelings, and in which those who have spoken have emphasized those expressions, need no addition from me, but I must add my personal tribute. I am satisfied that no one man has done so much to place the United Gas Improvement Company where it stands to day as Mr. Alexander C. Humphreys. By training, by natural aptitude, he has been peculiarly fitted to combine the commercial and engineering management of our business, and this very fact has brought him into closer touch with every man in the service than it has been the privilege of any other man to be brought. Certainly the greatest element of success in this life is character; to build up a true character in ourselves and help our fellowmen to build up their characters. They say that corporations have no souls, but I don't believe it. The soul of a corporation is the composite soul of those who represent it, and certainly no corporation in this broad land has a nobler, broader soul than is represented in the characters of the men that Mr. Humphreys has drawn together around him in the management of this business.

He has not been satisfied with impressing his influence on you, and learning to know each one of you individually, but he has worked away on what he has often found to be very rocky soil, on the hearts of the President and General Manager, so that we have come to know you, not by the cold figures of the chart, but as individual men; each one with his own particular capacity, and his own particular strong and weak points. Beside the element of character there must be the element of life. Mr. Humphreys has selected in days gone by, as assistants in the development of the business, two good and true men, worthy in every respect to take up the mantle that he lays down, Walton Clark, as General Superintendent, in charge of the engineering department, and Lewis Lillie, as Comptroller, in charge of the commercial department.

Mr. Humphreys, in the trials and rebuffs and disappointments that are to befall you, as befall all of us they must, you will have no truer sympathizers than we. We know how bravely you will bear them. In the great successes that we hope and believe are in store for you, there will be no heartier plaudits than those which come from your old friends who rally under the banner of the United Gas Improvement Company. We can pay you no greater compliment, I know, than to promise you that we will not rest satisfied with the standard you have established, but will do our utmost to elevate it.

At the conclusion of Mr. Bodine's remarks, the question was put as follows:

Chairman—The question is upon the adoption of the resolution. Are you ready for the question?

Mr. Keppelman—I would suggest a rising vote.

Chairman—All in favor of the adoption of the preamble and resolution will rise. There is no necessity to put it to a negative note. The vote is unanimous. Mr. Humphreys, the business for which I took the chair having been completed, I now resign it to you.

Mr. Humphreys—I wish I was capable of properly thanking you for the action just taken, and that I could find words to express my feelings. At no time am I capable of properly expressing my feelings, and certainly I am not at this moment. I will only say that I fully appreciate all the kind words said. You have overstated the facts as far as my ability is concerned, but it is an immense satisfaction for me to feel, as I really do feel, that all the words and expressions come from such a kindly feeling towards me that you are therefore led to overstep the facts. I feel that in every man in this room I have a friend. I hope with Mr. Bodine that you will not be satisfied with the standard which we have at present arrived at, but that you will go steadily forward improving in the future, and I can assure you that in no way can I feel a greater satisfaction in my work performed than in the fact that the improvement is continuing. Gentlemen, I thank you one and all most heartily.

ITEMS OF INTEREST FROM VARIOUS LOCALITIES.

A. P. ELDER, of Ottawa, Kansas, has purchased a controlling interest in the Ottawa Gas Company, which was held by Clifford C. Goodwin, of New York, and has associated with him Messrs. Elder, Buker and others of Ottawa in the venture. The owners propose to enlarge and repair the plant, and it is also probable that an electric lighting annex will be added.

AT a meeting of the shareholders in the Rochester (Minn.) Light and Fuel Company the following officers were chosen: Directors, D. Rhomberg, Wm. Mulcahy, E. H. Meyer, A. Bierman, Thos. Hennessy, T. H. Titus and Geo. D. Parmelee; President, D. Rhomberg; Vice-President, T. Hennessy; Secretary, Geo. D. Parmelee; Treasurer, T. H. Titus. These were all re elections, save in the instance of Parmelee, who succeeds Mr. A. T. Stebbins.

THE gas coal movers on the Clinch Valley Division of the Norfolk and Western Railroad have refused to enter the combination for a general strike. They are now working full time and propose to continue doing so.

THE Schenectady (N.Y.) *Union* reports that on April 24th the plant of the Schenectady Gas Light Company was purchased by Mayor Clute, who acted as attorney for the Westmoreland Coal Company. There was a mortgage for $100,000 on the property to secure a similar amount in bonds. The nominal prices obtained were: Personal property, $16; site, $6; plant, $6. There will be a purchase of the bonds at about 50 per cent., and the purchasers are judgment debtors. It will be some time before absolute control is secured, but it is the intention of the purchasers to carry out an extensive system of repair on the manufacturing and distributing plants. The leakage in fact has been so great (some put it as high as 50 per cent.) that the city will virtually have to be repiped. With this state of affairs it can readily be understood why gas rates have been abnormally high in Schenectady, but with the introduction of a better service the price for gas will be materially reduced, which is good news for consumers, who await with earnest expectancy the realization of the plans in view.

THE Batopilas Mining Company, of Chihuahua, Mexico, has placed an order for four iron buildings and four bridges with the Berlin Iron Bridge Company, of East Berlin, Conn. These buildings are to be shipped by steamer, to Galveston, Texas, from there by rail to the interior of Mexico, where they must be carted a distance of 100 miles, on mule back, up the mountain.

THE proprietors of the San Francisco Gas Light Company have purchased two lots on the south side of Salter street, off Stockton street, the dimension of the plot being 137 feet 6 inches by 53 feet 9 inches, on which they will erect handsome office buildings. The Company's present offices, at First and Natoma streets, have been occupied by it since 1854, and many of the famous business men of 'Frisco have met for counsel within its walls.

THE Mechanicsburg (Pa.) gas works are to be rebuilt, on a site in the eastern part of the town.

IN our issue of April 23d some mention was made of recent changes in the management of the separate works of the American Gas Company, which mention was not in strict accordance with the facts. The real nature of the situation is like this: Mr. C. H. Dunbar, formerly Superintendent at New Rochelle, N.Y., has taken Mr. R. F. Fitz's place at Elgin, Ills.; Mr. Ralph Woodward, formerly Superintendent at Peru, Ind., replaces Mr. Dunbar as Superintendent at New Rochelle, N.Y., and Mr. A. J. Reinbold has been appointed Superintendent at Peru, Ind. As before stated in the JOURNAL, Mr. Fitz's retirement from the practice of his profession was occasioned solely by ill-health.

At the annual meeting of the stockholders of the Florence (Ala.) Gas Light and Fuel Company the following Directors were elected: W. A. Stedman, Newport, R. I.; D. R. Russell and Frank Wooster, Jr., of St. Louis, Mo., and J. J. Mitchell, A. E. Walker, C. W. Butterworth and J. W. Walker, of Florence.

The Cincinnati Gas Light and Coke Company, according to the Cincinnati *Star*, has taken out a permit from the local building inspector to construct retort house, No. 5, at the West End Station on Front street, between Park and Rose. The structure is to be 110 feet by 345 feet, and will be of brick, iron and stone. It is to be one story with a basement, of handsome architecture, and the estimated cost is $40,000. The foundation, which has been under construction for a year, cost $15,000.

Mr. Charles Truesdell, formerly Superintendent of the Homer and Cortland (N. Y.) Gas Company, died at his home in Philadelphia on the evening of April 23d, to which city he removed (in 1891) on resigning his position at Homer.

The citizens of Asbury Park, N. J., are agitating the subject of cheaper gas. The desired figure is put at $1.50 per 1,000 cubic feet, the ruling rate being $2, gross.

The proprietors of the Fitchburg (Mass.) Gas and Electric Light Company have closed a contract with the Fort Wayne (Ind.) Electric Company, for a 75 arc light dynamo, which is to be put in position this month.

At a special meeting of the stockholders of the Equitable Gas Company, of Pittsburgh, Pa., it was decided to increase the indebtedness of the Company $500,000 for the purpose of making extensive improvements all along the lines.

Mr. Walter A. Allen, Superintendent of the Municipal Gas Company, of Albany, N. Y., resigned that position on May 1st in order to accept the position of Superintendent of the New York Mutual Gas Company, succeeding his brother, the late Henry F. Allen.

"Observer" sends the following: "At a meeting of the Directors of the Gloucester (Mass.) Gas Light Company, held towards the close of April, it was voted to reduce the price of gas, from July 1, 1894, to $1.60 per 1,000 cubic feet, with a discount of 12½ per cent. on all bills paid on or before the 15th of the month in which they are rendered, provided all previous bills are paid, making the net price of gas $1.40. It was also voted to lay a larger main on Washington street, from Mansfield to Derby, to accommodate the largely increased consumption in that neighborhood, and it is also understood that other extensions will be made. The Company intends to give several cooking lectures a little later in the season, of which due notice will be given." All of which goes to show that Superintendent Coffin's hand has not lost its cunning.

T. F. Parker, of Concord, N. H., writing to us under date of April 28th, says: "Some time ago I saw in the Journal an intimation that the proposed gas works for Laconia, N. H., would soon be a material thing, and according to advices which come to me by way of Manchester, I may say your prognostication was correct. It seems that a plot of land, on Messer street and the bridge half way between Laconia Center and Lakeport, has been purchased, the location having been selected with a view to putting the manufacturing plant where it would not be objectionable to residents, and from the fact of its being easy of access from all directions. The pipe for the main through Church street has been ordered, and it will be put down early in May, to enable the authorities to concrete that thoroughfare at as early a date as possible. Some 12 miles of gas mains will be laid, and the owners mean to go on with the manufacturing plant so as to be ready for active business by September 1st, at the latest. At a stockholders' meeting the following officers were chosen: Directors, H. C. Buck, L. R. Wallis and John O'Loughlin; President, H. C. Buck; Treasurer, L. R. Wallis; Clerk, Fred. A. Young. It looks to me that a Gas Company well managed ought to prove a paying venture in Laconia, and the gentlemen in charge of the proposed enterprise are well qualified to make 'a go' of it, if anyone can."

At the annual meeting of the Sandusky (O.) Gas Light Company, the following Directors were elected: Jas. Woolworth, G. W. Paine, H. H. Knight, G. R. Butler, P. L. Van Alstyne, J. O. Moss, Watson Hubbard, C. W. Sadler, Chas. H. Moss, Geo. Flick, J. S. Cowdery, John Whitworth, John Homegardner, Gottlieb Epple, J. T. Mack, H. C. Huntington and A. C. Moss.

At a meeting of the Lumbermen's Association, of Chicago, the following self-explanatory action was taken:

Whereas, The Gas Companies with works on the south branch of the Chicago river, illegally and in defiance of the city ordinance, empty inflammable refuse from their works into said south branch of the Chicago river, thus imperiling the safety of property along the river; and,

Whereas, Such special hazard is a menace not only to the property of lumbermen and all other interests doing business along the south branch, but to the entire city; therefore be it

Resolved, That the President of this Association appoint a committee of five to consult with representatives of other interests similarly affected, and to devise methods by which the above named abuse may be abated; and be it further

Resolved, That the Secretary of this Association be instructed to canvass the interests concerned herewith and request from them their cooperation with the committee of this Association above authorized; and be it further

Resolved, That it is the sense of this meeting that legal counsel should be taken with a view of making the city of Chicago, or the Gas Companies, or both, legally liable for any damage to property that may result from such special hazard so created.

At the annual meeting of the Columbus (Ohio) Gas Company the following officers were chosen: Directors, E. McMillin, W. H. Doane, N. B. Abbott, D. E. Putnam, C. D. Firestone, Irvin Butterworth, P. H. Bruck, Frank C. Hubbard and James Watson. At the organization meeting of the Board this result was reached: President, E. McMillin; First Vice-President, Irvin Butterworth; Second Vice-President, D. E. Putnam; Secretary-Treasurer, A. P. Lathrop; Assistant Secretary-Treasurer, Z. L. Horton. The committee appointed to consider the expediency and cost of a new plant reported progress, and a motion to continue the committee prevailed.

The officers chosen by the Flatbush (L. I.) Gas Company are: President, William Brown; Secretary, Abraham I. Ditmas; Treasurer, Jeremiah Lott.

Judge Buckles, of the Superior Court, has refused to confirm the recent sale of the Vallejo (Cal.) Electric Light Company's plant, which, it will be remembered, was bid in at sheriff's sale, early in April, by ex-Senator James McCudden, at his bid of $2,850 The Judge holds that the sum bid was far below the value of the property, but other close observers say that the sum bid was more than the plant was worth.

Messrs. C. E. Titman and E. J. Wasley have acquired a controlling interest in the Shenandoah (Pa.) Gas and Water Company, a circumstance which will, it is said, put an end to the legal controversies that have been going on for some time between the Company and the local authorities.

One would suppose that a member of a meter gang would be the last party of any to hunt around a leaking meter with a match for the purpose of locating a break in a connection or anything of that sort. The Brookline Company, of Brookline, Mass., however, has such a man, who some days ago tried this way of locating a leak—it was in the cellar of the Hotel Baldwin, on Northampton street—and it is needless to say that he "found" it. The meter was shattered, but the meter man was unharmed.

Levi Stevens, who operates a gas plant that supplies gas to the State Prison of New Jersey, which gas men, of course, will have to be told is located in Trenton, has been relieving his mind of figures by which he attempts to prove that the Trenton Gas Light Company could make a profit in selling gas at 75 cents per 1,000 cubic feet. The trouble with Stevens is that he has been trying to sell his "process" to the Trenton Company, whose level-headed proprietors have refused and do refuse to deal, a determination which evidently causes Stevens to make trouble for the Company, in one shape or another.

Mr. Herbert S. Holt, the recently chosen President-Engineer of the Montreal Gas Company, emphatically denies that his Company will come to any terms with the manipulators of the opposition Company. Meanwhile clever local financiers insist that a deal will be made, and we believe that the financiers take the correct view of it.

The gas war in Brooklyn is well on, the Fulton Municipal Company having openly proclaimed the dollar rate, a rate which virtually has been obtainable for some weeks by the consumers of gas supplied by the Williamsburg and Fulton Companies. What will be the end?

On the complaint of Colonel William A. Bancroft, Mayor of Cambridge, Mass., the Cambridge Gas Light Company was before the Board of Gas and Electric Light Commissioners on the morning of April 27th to show cause, if any, why it shall not reduce the price of gas in that city. Mr. G. A. A. Peavey, City Solicitor of Cambridge, appeared for the petitioner, and ex Governor Russell for the Gas Company. An attempt was made by Mr. Russell to have the hearing limited to the gas furnished to the city of Cambridge, but Colonel Wheelwright, Chairman of the Board, ruled that the inquiry would include all the gas furnished by the Company, which also supplies Somerville. Mr. Peavey, in opening for the petitioner, read the report of the Committee of the Council, recommending the reduction of the price of gas, and stating that in 1892 the Company's earnings were 15 per cent. on its capital, 10 per cent. of which was paid in dividends and the balance passed to the reserve fund. He said that the Company has invariably paid 10 per cent. dividends, and has also passed large sums to the reserve fund. The quality of gas has been of an inferior kind, sold at a high price. It has next to the largest capital of any gas company in the State, outside of Boston, and it is composed of a few individuals who divide among themselves large dividends. The Company is so favorably situated as to location that its operating expenses are comparatively small. Slight reductions have been made in the price of gas, from $2 to $1.75, in 1889; to $1.60, in 1890; to $1.50, in 1893; and the price is now $1.35. In 1890, when the price was $1.60, $20,000 were laid aside as surplus, after paying expenses and dividends. The Company could have sold its gas during three years at $1.13 per 1,000 feet, and yet have paid good dividends. Louis M. Hastings, City Engineer of Cambridge, testified that the streets were favorable for trenching, there being no serious impediments to digging. The wharves are favorable for the landing of coal. In Somerville there are ledges, and in East Cambridge there is much clay, which makes the digging hard. This concluded the testimony introduced by the petitioners. Mr. Russell then gave a history of the Company, saying that it had nothing to conceal, and he proposed to introduce testimony showing that its business had at all times been conducted for the best interests of the public. The capitalization, he said, was lower than that of any other gas company in cities of the country similarly circumstanced. Its business has always been conducted in the most conservative and economical manner; it has never watered its stock, and has never been capitalized to the extent permitted by law. Whatever surplus it has is retained for the purposes which this Board has declared should be provided for. It has doubled its output of gas in 10 years, and it has in many ways increased its facilities for doing business. It has fully developed its field in Cambridge, and it compares favorably in this respect with every Company in the State. The dividend paid is but about 6 per cent. on the market value of its stock. It is not a high dividend, considering the jeopardy in which this Company is now placed by the action of the city of Cambridge, which is liable at any time to take possession of its plant and drive it out of business. The price for manufacturing gas is $1.33 per 1,000 cubic feet, including dividend on stocks, while the selling price is but $1.35. Since 1881 it has made seven reductions in the price of gas, and during the last year it has reduced its price 15 per cent. Adolph Vogel, the Treasurer of the Cambridge Gas Light Company, testified as to the financial condition of the Company and the number of the stockholders and their holdings, showing that more than two-thirds of the stock is held by women and trustees. He said that the stock, since 1873, had always sold above par, and the great bulk of it is in the hands of people who have paid more than par. The Commissioners took the case under advisement.

The Standing and Select Committee on Private Bills, Canadian Parliament, have passed the bill introduced by the Ottawa Gas Company. Mr. Ferguson, Q.C., on behalf of the Company, explained the provisions of the bill, which are to permit it to borrow money and issue bonds or debentures therefor in sums of not less than $100 each.

The proprietors of the Stamford (Conn.) Gas Company have determined to abandon the "baby process" water gas set hitherto in use at that works, and will substitute therefor an improved Lowe apparatus.

The Berlin Iron Bridge Company, of East Berlin, Conn., is putting up a new transfer station for the Washington and Georgetown Railroad Company, at Washington, D. C. The same contractors are putting up an iron and steel building, seven stories high, for James Petit, of New York city.

In reply to numerous inquiries respecting the consolidation of the Gas Companies in Newark, N.J., mention of which was made in our issue for April 30th, we can only say that we have heard nothing more about the project.

The Synthesis of Ammonia.

Le Genie Civil notes that in June and November, 1893, Mr. P. R. Lambilly, of Nantes, patented a process for the production of ammonia by synthesis—a problem that has been pursued for a long time and the importance of which is classic. According to the *Moniteur de Quesneville*, the operation is effected as follows:

The process is based upon the reciprocal action of nitrogen, hydrogen and aqueous vapor in the presence of substances that act by contact. It is characterized by the addition to the gaseous mixture of carbonic acid, which fixes the ammonia formed in the state of bicarbonate or formate.

As we know, ammonia, or hydrate of ammonium, has the property of forming salts with acids or the anhydrides of acids. It behaves in this case as an energetic base.

Through their formation from the elements, the bicarbonate and formate of ammonia disengage a quantity of heat that exceeds by more than 20 calories that which is produced by the union of the elements for the formation of hydrate af ammonium. According to Mr. Lambilly, this circumstance shows the advantage that may be derived from the direct preparation of these salts by means of free nitrogen. Such preparation, moreover, is realizable, since it suffices to produce the ammonia in the presence of oxide of carbon and carbonic acid or anhydrides of formic and carbonic acid. The reactions to be effected are the following:

$$Az + H^3 + CO^2 + H^2O = CO \begin{cases} OAz\ H^4 \\ OH \end{cases}$$

$$Az + H^3 + CO^2 + H^2O = H\ CO^2\ Az\ H^4$$

Or else:

$$2Az + 8H + 2CO^2 + H^2O = CO \begin{cases} OAz\ H^4 \\ OH \end{cases} \Big\} + H\ CO^2AzH^4$$

In fact, such reactions occur when the constituents, nitrogen, aqueous vapor and water gas, of a mixture of hydrogen, CO and CO^2, are brought into contact with certain porous substances, such as pumice stone, charcoal and boneblack, especially when they are platinized. They are produced even at a low temperature in the presence of spongy platinum or platinum black. They are more active, however, at temperatures near the points of dissociation of the salts, that is to say, toward 40–60° C. for the bicarbonate and 80–160° C. for the formate.

The gaseous mixtures pass into pipes filled with porous bodies heated to the temperatures indicated. Upon their entrance into the pipes they are saturated with aqueous vapor, either by the injection of a current of steam or by their passage into water heated to the proper temperature. Upon making their exit from the apparatus the gases pass into the water, wherein the ammoniacal salts formed dissolve. The gases that have not acted are collected and are sent back into the apparatus for a second time.

The solution of the salts is distilled over lime. If formate of ammonia is found therein, there is obtained, as an accessory product, formate of ammonia, which might serve for the preparation of formic acid or of salts.

It belongs to special industrial chemists to estimate the value of this process of synthetical fixation of nitrogen and to reduce it, outside of any pure scientific conception, to its just proportions.

The Calibration of Indicators.

Engineering Magazine says that the indicator is to the engineer what the chronometer is to the navigator, and the reliance which is placed in the indicator diagram should be based upon similar methods of correction and calibration. No horologist attempts to claim absolute accuracy for his chronometers; he is satisffed if he can secure a practically constant rate of error, and this rate is determined and re determined periodically by comparison at national observatories so that the application of the ascertained correction will enable a degree of accuracy within the required limits to be obtained. A like method of calibration for indicators is entirely in accordance with modern methods, and Chief Engineer David Smith, U.S.N., in his paper before the Engineering Congress at Chicago, very properly observed that to attempt to correct an indicator at the spring is about as likely to prove successful as would be a similar attempt at the mainspring of a chronometer. By using a given indicator to measure quantities of power already accurately known, it is practicable to construct corrected scales for use at various speeds and conditions corresponding to those under which they were calibrated, and thus, by applying the universally accepted method of working from the greater to the lesser, we may feel confident of the accuracy of subsequent determinations within the range of the original limits of observation.

The Market for Gas Securities.

The market for Consolidated was not animated during the interim, and the figures given today (Friday) show no change from those of a week ago. From the way the shares act it looks that the street has figured the normal value of Consolidated at about 138, under the existing conditions. The terribly near-sighted policy of the Brooklyn Companies in cutting the legal selling rate is sure to have a bad effect on New York City shares, for no one now doubts that the Legislature will next year apply the pruning knife. Mutual gas is bid for at 150, and no stock is offering at that figure. Equitable is strong, at 185 to 190. Brooklyn shares are in the dumps, as they should be, and ordinary shareholders ought not to have a very exalted opinion of those whom they designated to manage their interests. Every Brooklyn share is a sale. Chicago gas, despite Dogberry Moloney's legal fireworks, is moving along steadily, having sold this morning at 65⅝. It ought to be good for 70, without a doubt. Consolidated, of Baltimore, is in demand, at 66 and 66¼, and Consumers, of Jersey City, maintains fairly well its recent sharp advance. We note a sale at auction of 100 shares Indianapolis gas at 133½.

Advertisers Index.

GAS ENGINEERS. Page

Jos. R. Thomas, New York City..... 670
Wm. Henry White, New York City..... 683
Fred. Bredel, New York City..... 679
H. C. Slaney, New York City..... 670
Geo. R. Rowland, New York City..... 670
Joseph P. Gill, New York City..... 670

CHEMISTS.

Durand Woodman, New York City..... 670

PROCESSES.

Bartlett, Hayward & Co., Baltimore, Md..... 681
United Gas Improvement Co., Phila, Pa..... 673
Burdett Loomis, Hartford, Conn..... 683
National Gas and Water Co., Chicago, Ills..... 675
Economical Gas Apparatus Construction Co., Toronto, Ont. 674
The Western Gas Construction Co., Fort Wayne, Ind..... 674

GAS WORKS APPARATUS AND CONSTRUCTION.

James R. Floyd & Sons, New York City..... 683
Continental Iron Works, Brooklyn, N. Y..... 682
Deily & Fowler, Phila., Pa..... 683
Kerr Murray Mfg. Co., Fort Wayne, Ind..... 680
Stacey Mfg. Co., Cincinnati, Ohio..... 683
Bartlett, Hayward & Co., Baltimore, Md..... 681
Davis & Farnum Mfg. Co., Waltham, Mass..... 680
R. D. Wood & Co., Phila., Pa..... 682
Isbell-Porter Company, New York City..... 682
Fred. Bredel, New York City..... 679
United Gas Improvement Co., Phila., Pa..... 673
Berlin Iron Bridge Company East Berlin, Conn..... 670
National Gas and Water Co., Chicago, Ills..... 675
Economical Gas Apparatus Construction Co., Toronto, Ont. 674
The Western Gas Construction Co., Fort Wayne, Ind..... 674
C. Cunningham, Brooklyn, N. Y..... 668

SCRUBBERS AND CONDENSERS.

G. Shepard Page's Sons, New York City..... 684
R. D. Wood & Co., Phila., Pa..... 682
James R. Floyd & Sons, New York City..... 684
Continental Iron Works, Brooklyn, N. Y..... 682

REGENERATIVE FURNACES.

Bartlett, Hayward & Co., Baltimore, Md..... 681
Fred. Bredel, New York City..... 679
J. H. Gautier & Co., Jersey City, N. J..... 679
Parker-Russell Mining and Mfg. Co., St. Louis, Mo..... 678

TAR AND CARBONIC ACID EXTRACTOR.

Geo. Shepard Page's Sons, N. Y. City..... 648

AMMONIA CONCENTRATOR.

Michigan Ammonia Works, Detroit, Mich..... 667

GAS METERS.

John J. Griffin & Co., Phila., Pa..... 686 688
American Meter Co., New York and Philadelphia..... 687
The Goodwin Meter Co., Philadelphia, Pa..... 472
Helme & McIlhenny, Phila., Pa..... 687
D. McDonald & Co., Albany, N. Y..... 687
Nathaniel Tufts, Boston, Mass..... 686
Maryland Meter and Manufacturing Co., Baltimore, Md.... 686
Harris Bros. & Co., Philadelphia, Pa..... 686
Metric Metal Co., Erie, Pa..... 685

GAS AND WATER PIPES.

Ohio Pipe Co., Columbus, Ohio..... 685
M. J. Drummond, New York City..... 685
R. D. Wood & Co., Phila., Pa..... 682
Warren Foundry & Machine Co., New York City..... 685
Donaldson Iron Co., Emaus, Pa..... 685
Addyston Pipe and Steel Co., Cincinnati, O..... 685
John Fox, New York City..... 685

STEAM BLOWER FOR BURNING BREEZE.

H. E. Parson, New York City..... 679

GAS COALS.

Penn Gas Coal Co., Phila., Pa..... 677
Perkins & Co., New York City..... 676
Despard Gas Coal Co., Baltimore, Md..... 677
Westmoreland Coal Company, Phila., Pa..... 677

CANNEL COALS.

Perkins & Co., New York City..... 676
Log Mountain Coal, Coke and Timber Co., Pineville, Ky... 677

GAS ENRICHERS.

Standard Oil Co., Cleveland, Ohio..... 677
The Sun Oil Co., Pittsburgh, Pa..... 677

COKE CRUSHER.

C. M. Keller, Columbus, Ind..... 677

INCLINED RETORTS.

Parker-Russell Mining and Mfg. Co., St. Louis, Mo..... 678

AIR COMPRESSORS.

Clayton Air Compressor Works, New York City..... 667

COAL TAR PUMPS.

Clayton Air Compressor Works, New York City..... 681

GAS GAUGES.

The Bristol Co., Waterbury, Conn..... 679

GAS GOVERNORS.

Connelly Iron Sponge and Governor Co., New York City.. 675
Wilbraham Baker Blower Co., Phila., Pa..... 675
Isbell-Porter Co., New York City..... 682

RETORTS AND FIREBRICK.

J. H. Gautier & Co., Jersey City, N. J..... 678
B. Kreischer & Sons, New York City..... 678
Adam Weber, New York City..... 678
Laclede Fire Brick Mfg. Co., St. Louis, Mo..... 678
Borgner & O'Brien, Phila., Pa..... 678
James Gardner, Jr., Pittsburgh, Pa..... 678
Henry Maurer & Son, New York City..... 678
Baltimore Retort and Fire Brick Co., Baltimore, Md..... 678
Parker-Russell Mining and Mfg. Co., St. Louis, Mo..... 678
Brooklyn Fire Brick Works, Brooklyn, N. Y..... 678
F. Behrend, New York City..... 667

CEMENTS.

C. L. Gerould & Co., Brooklyn, N. Y..... 678
F. Behrend, New York City..... 667

GASHOLDER TANKS.

J. P. Whittier, Brooklyn, N. Y..... 679
W. C. Whyte, New York City..... 679

GASHOLDER PAINT.

The Government Waterproof Paint Co., Boston, Mass..... 681
New York Marine Paint Co., Poughkeepsie, N. Y..... 68.

SELF-SEALING MOUTHPIECE DOORS.

Isbell-Porter Company, New York City..... 682
Continental Iron Works, Brooklyn, N. Y..... 682

BURNERS.

C. A. Gefrorer, Phila., Pa..... 667
Moses G. Wilder, Phila., Pa..... 667

LAVA GAS TIPS.

D. M. Steward Mfg. Co., Chattanooga, Tenn..... 667

STREET LAMPS.

J. G. Miner, Morrisania, New York City..... 679
Bartlett Street Lamp Mfg. Co., New York City..... 679

PURIFYING MATERIAL.

Connelly Iron Sponge and Governor Co., New York City... 675
Greenpoint Chemical Works, Brooklyn, N. Y..... 675
Henry W. Douglas, Ann Arbor, Mich..... 675
Read, Holliday & Sons, Ltd., New York City..... 667

EXHAUSTERS.

The P. H. & F. M. Roots Co., Connersville, Ind..... 672
Isbell-Porter Company, New York City..... 682
Wilbraham Baker Blower Co., Philadelphia, Pa..... 675
Connelly Iron Sponge and Governor Co., New York City.... 675

VALVES.

Ludlow Valve Manufacturing Co., Troy, N. Y..... 681
Chapman Valve Manufacturing Co., Boston, Mass..... 681
R. D. Wood & Co., Phila., Pa..... 682
Continental Iron Works, Brooklyn, N. Y..... 682
John Fox, New York City..... 685
The P. H. & F. M. Roots Co., Connersville, Ind..... 672
Isbell-Porter Co., New York City..... 682

ELECTRICAL APPARATUS.

Wm. Henry White, N. Y. City..... 683
Fort Wayne Electric Co., Fort Wayne, Ind..... 667

GAS ENGINES.

Schleicher, Schumm & Co., Phila., Pa..... 672

ENGINES AND BOILERS.

The Hazelton Boiler Co., New York City..... 669

PURIFIER SCREENS.

John Cabot, New York City..... 679

GAS STOVES.

American Meter Co., New York and Philadelphia..... 671
The Goodwin Meter Co., Phila., Pa..... 472
George M. Clark & Co., Chicago, Ills..... 669
Maryland Meter and Manufacturing Co., Baltimore, Md.... 686
The Schneider & Trenkamp Co., Cleveland, O..... 668

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987-1

RECEIVER'S SALE.

By virtue of an order and decree granted by the Circuit Court of the United States, for the Northern District of Georgia, in the case of International Trust Company vs. The Cartersville Improvement Gas and Water Company et al., now pending in said Court, the undersigned, appointed receiver in said case, of all and singular the property of The Cartersville Improvement Gas and Water Company, defendant, will expose to sale at public outcry to the highest bidder, before the Superior Court House door, in Atlanta, Ga., on the first Tuesday in July next, within legal sale hours, the following described property, to wit: The entire Gas Works, known as The Cartersville Improvement Gas and Water Company's Gas Plant, located and being in the city of Cartersville, Bartow County, Ga., consisting of the following lands, fixtures and appurtenances, to wit: A certain tract of land situated in Cartersville, Bartow County, Ga., containing one acre more or less, bounded on the north by Cook street, west by Erwin street, south and east by lands of Amos T. Akerman, deceased, being the tract of land conveyed by Martin Collins to Cartersville Improvement Gas and Water Company by deed recorded in book "A.A." of deeds, page 151, Clerk's office, Bartow Superior Court: also a certain other parcel of land, in the city of Cartersville, Bartow County, Ga., containing two acres more or less, the same being a square tract of land, each side 282 feet long, situate on Cook street, in the Third Ward of said city, boundary commencing at the intersection of the center line of Cook street with the center line of Bartow street, running from said point thence south along the east line bounding the lands of A. M. Willingham 282 feet, thence running east parallel with Cook street 282 feet, thence north parallel with the east line of said Willingham lot aforesaid to the center line of Cook street, thence along said Cook street to the point of beginning, the same being the parcel of land conveyed by William J. Neel to the Cartersville Improvement Gas and Water Company, by deed recorded in book "A.A.," pages 327 and 328, record of deeds, Clerk's office, Bartow Superior Court.

Also all buildings, machinery, improvements and equipments now located on said last described parcel of land, and used for the purpose of manufacturing, conserving, distributing and selling gas, including the engines, piping, boilers, water tanks, gasholders and oil tanks; and also all gas pipes, lamp posts, street mains, service pipes and globes, located in the city of Cartersville, Ga., and connected with said Gas Plant for the distribution of gas through said city, together with all tools, gas fixtures, fittings and supplies, rights, privileges, franchises and appurtenances belonging thereto. All of said property now being in the possession of the undersigned as Receiver aforesaid, and all to be sold by virtue of the order and decree aforesaid, as the property of the Cartersville Improvement Gas and Water Company.

The terms of sale will be as follows: One thousand dollars to be paid by the purchaser to the Receiver in cash, when the property is knocked off at said sale; one-third of the whole purchase price, including said one thousand dollars, to be paid on the confirmation of said sale by said Court; one-third to be paid in three months and one-third in six months from date of the confirmation of said sale by said Court, the said deferred payments to bear interest at the rate of six per cent. per annum from the date of confirmation of the sale as aforesaid, notes therefor to be executed and delivered by the purchaser to said Receiver, with security to be approved by said Receiver, the purchaser to have the right to pay the deferred installments at any time before the maturity thereof. The possession of the property to be delivered to the purchaser on confirmation of the sale by said Court. That upon the confirmation of the sale by the Court, and the payment of the first installment of one-third of the purchase price and delivery of the purchaser's notes to the Receiver, for the remaining installments the Receiver will execute and deliver to the purchaser, bond to make titles, on payment of the balance of the purchase money, the purchaser to be required to keep the property in reasonable repair until the purchase price is fully paid.

By virtue of said order and decree of said Court the Receiver will also receive private bids from anyone, at any time prior to the date of the public sale, same to be reported to said Court for acceptance or rejection.

For further information, address William B. Miller, Receiver of Cartersville Improvement Gas and Water Company, Cartersville, Ga.

This 24th day of April, 1894.

WILLIAM B. MILLER,
Receiver of the Cartersville Improvement Gas and Water Company.

986-4

Engagement Desired.

A Gas Engineer

of 20 years' experience in the manufacture of coal and water gas, and in the building and general superintendence of works, desires an engagement. Satisfactory references can be given.

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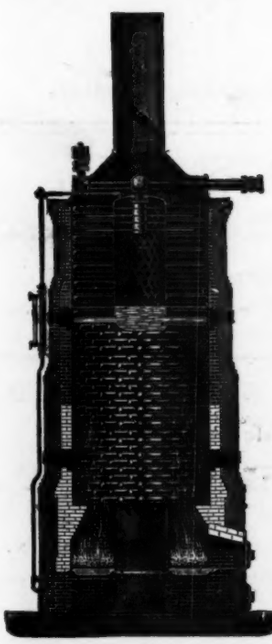

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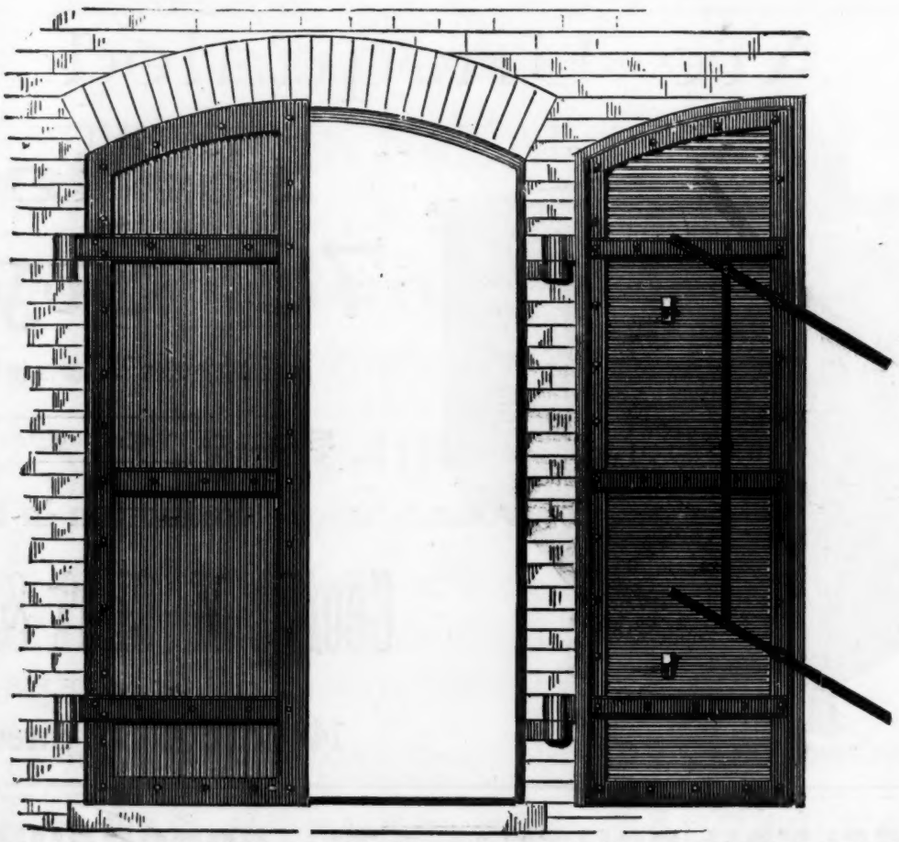

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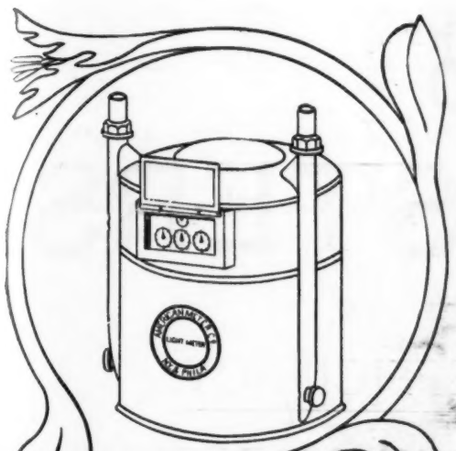

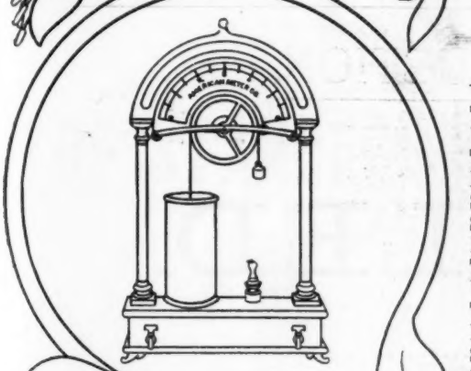

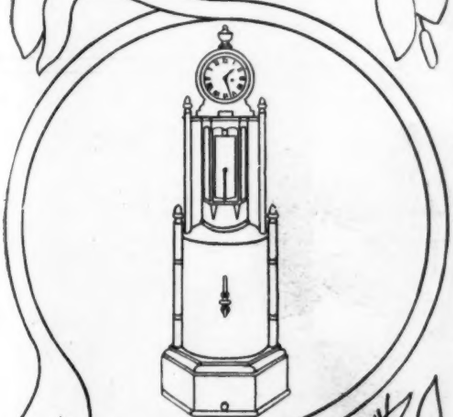

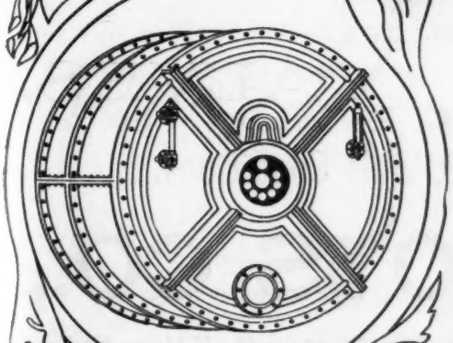

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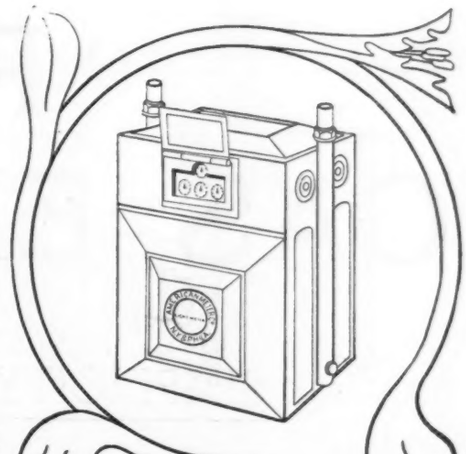
PUBLIC LIGHTING TABLE.

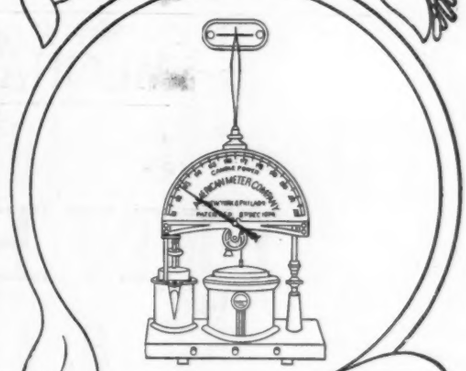
MAY, 1894.

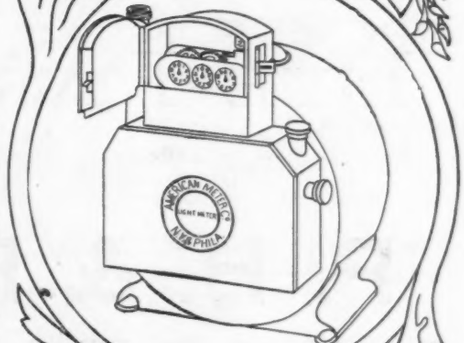
Day of Week.	Date.	Table No. 1. Following the Moon. Light.	Table No. 1. Following the Moon. Extinguish.	Table No. 2. New York City. All Night Lighting. Light.	Table No. 2. New York City. All Night Lighting. Extinguish.
				P.M.	A.M.
Tue.	1	7.20 PM	4.00 AM	6.45	4.00
Wed.	2	7.20	4.00	6.45	4.00
Thu.	3	7.30	4.00	6.45	4.00
Fri.	4	7.30	4.00	6.45	4.00
Sat.	5	7.30 NM	4.00	6.45	4.00
Sun.	6	7.30	3.50	6.45	4.00
Mon.	7	7.30	3.50	6.55	3.40
Tue.	8	7.30	3.50	6.55	3.40
Wed.	9	7.30	3.50	6.55	3.40
Thu.	10	11.10	3.50	6.55	3.40
Fri.	11	11.50	3.50	6.55	3.40
Sat.	12	12.20 AM FQ	3.50	6.55	3.40
Sun.	13	12.50	3.50	6.55	3.40
Mon.	14	1.10	3.50	7.00	3.30
Tue.	15	1.40	3.50	7.00	3.30
Wed.	16	2.00	3.40	7.00	3.30
Thu.	17	No L.	No L.	7.00	3.30
Fri.	18	No L.	No L.	7.00	3.30
Sat.	19	No L. FM	No L.	7.00	3.30
Sun.	20	7.40 PM	9.40 PM	7.00	3.30
Mon.	21	7.40	10.40	7.10	3.15
Tue.	22	7.40	11.30	7.10	3.15
Wed.	23	7.40	12.10 AM	7.10	3.15
Thu.	24	7.50	12.50	7.10	3.15
Fri.	25	7.50	1.20	7.10	3.15
Sat.	26	7.50	1.40	7.10	3.15
Sun.	27	7.50 LQ	2.00	7.10	3.15
Mon.	28	7.50	2.20	7.15	3.15
Tue.	29	7.50	2.50	7.15	3.15
Wed.	30	7.50	3.10	7.15	3.15
Thu.	31	7.50	3.30	7.15	3.15

TOTAL HOURS LIGHTING DURING 1894.

By Table No. 1.	Hrs.Min.	By Table No. 2.	Hrs.Min.
January	244.10	January	423.20
February	195.30	February	355.25
March	206.20	March	355.35
April	169.40	April	298.50
May	162.10	May	264.50
June	135.40	June	234.25
July	146.30	July	243.45
August	162.20	August	280.25
September	174.10	September	321.15
October	211.20	October	374.30
November	221.00	November	401.40
December	245.30	December	433.45
Total	2274.20	Total	3987.45







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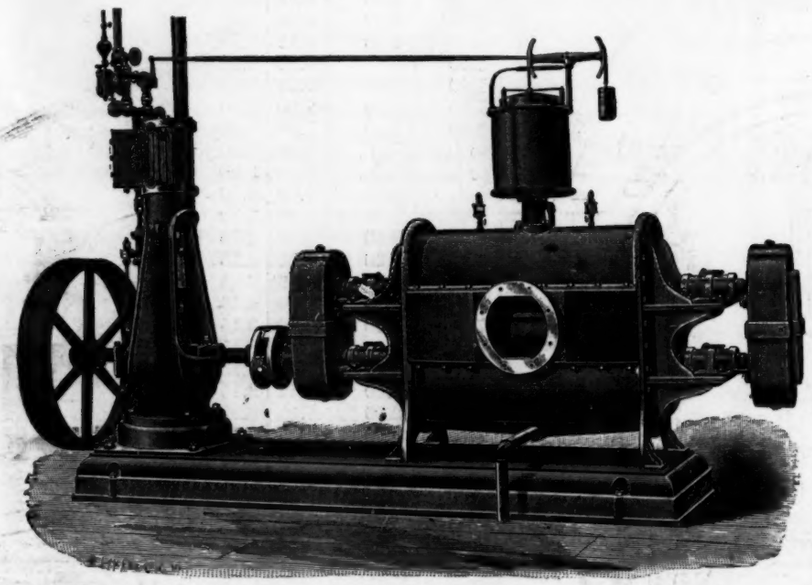

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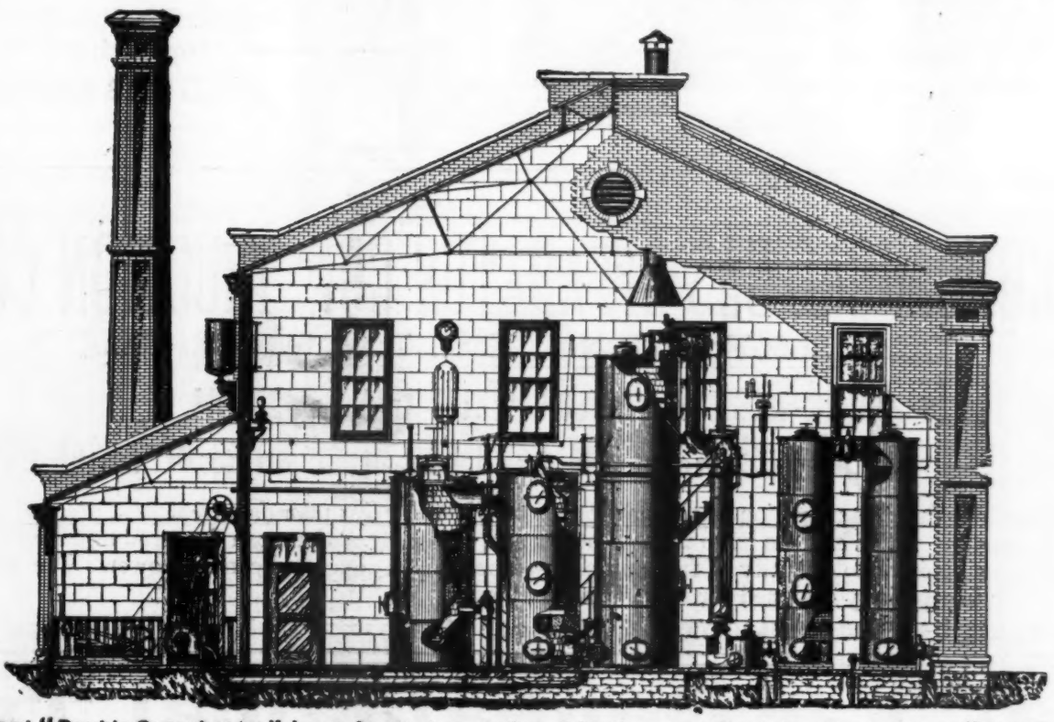

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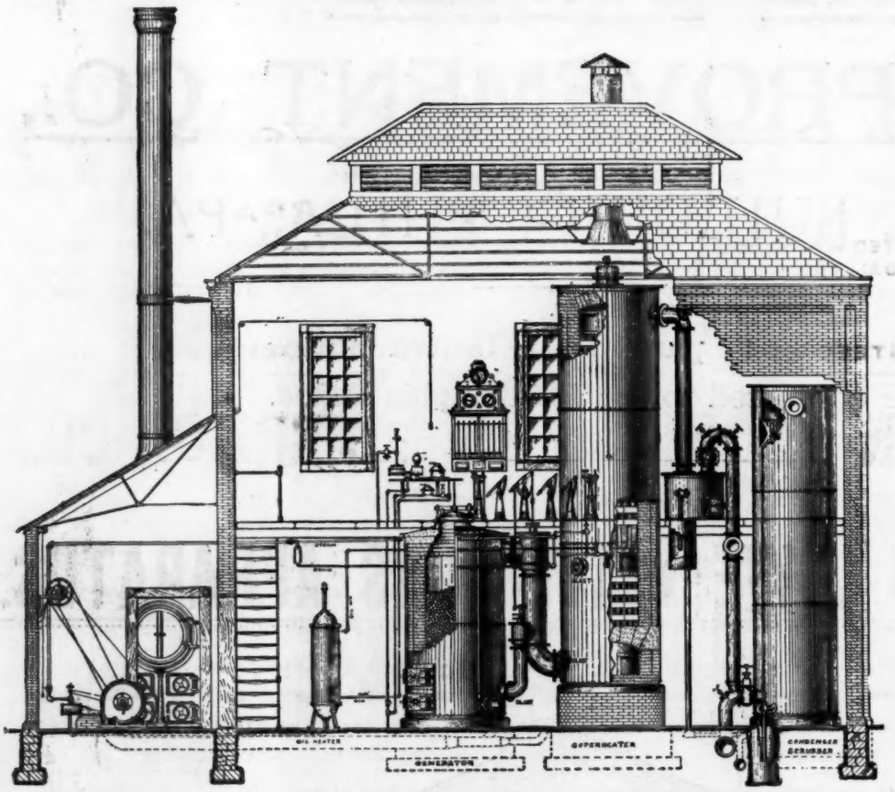

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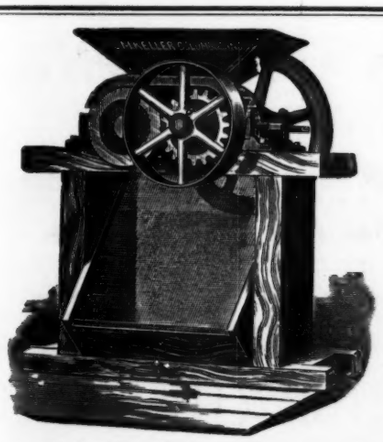

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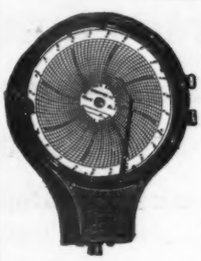

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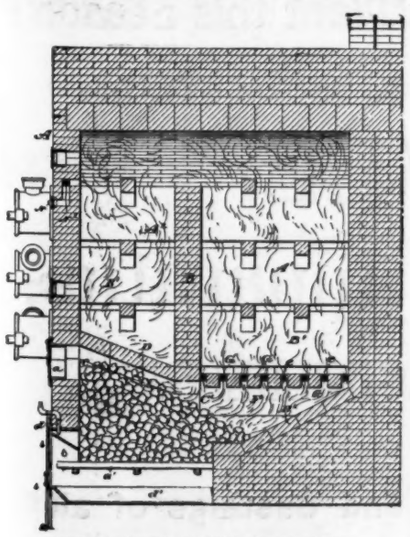

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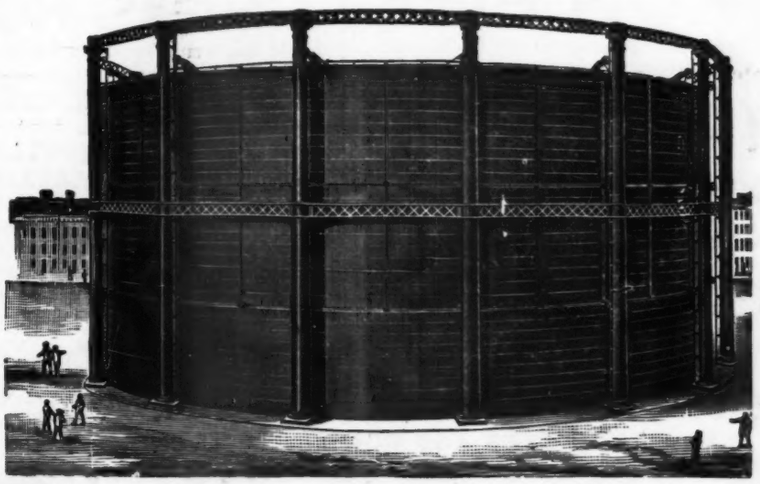

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Brunswick, Ga.	Norwich, Conn.	Mount Vernon, N. Y.		So. Chester, Pa.
Port Chester, N. Y.	Seattle, W. T.	Binghamton, N. Y.	Tacoma, Wash.	Cumberland, Md.
New Rochelle, N. Y.	San Diego, Cal.	Concord, N. H.	Knoxville, Tenn.	Auburn, N. Y.
Salem, N. J. (3d)	Westerly, R. I.	Dover, Del. (2d)	Pottstown, Pa.	DesMoines, Ia.
Omaha, Neb. (2d)	Northern Gas Lt. Co., of New York, N. Y.	Calais, Me.	Victoria, B. C.	Brooklyn, N. Y.
Lynn, Mass. (2d)		New London, Conn. (2d)	Vancouver, B. C.	Washington, D. C. (2d
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South Boston, Mass.	Attleboro, Mass.	Washington, D. C.	Woonsocket, R. I.	Sing Sing, N. Y.
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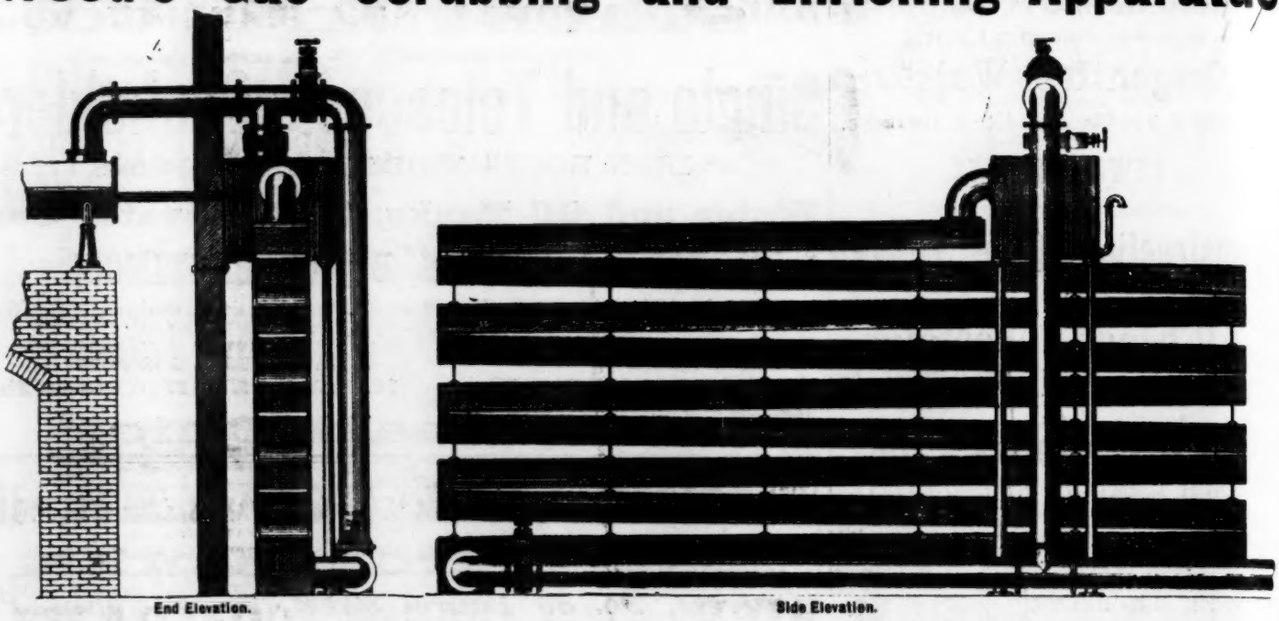

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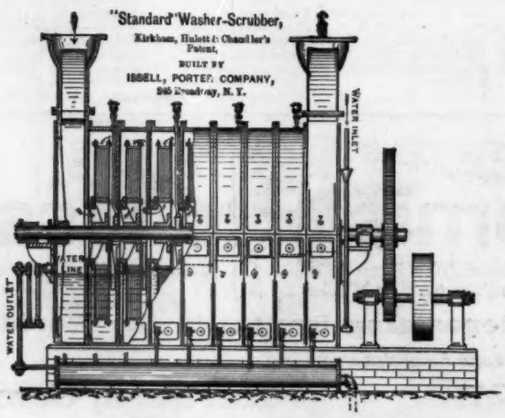

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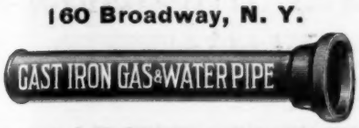

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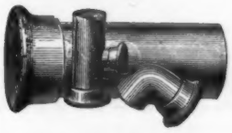
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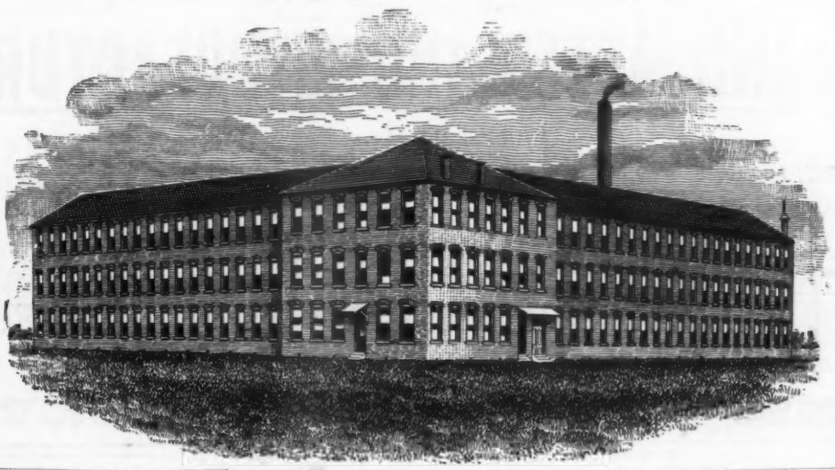
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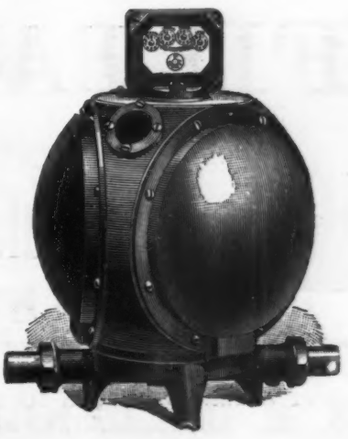
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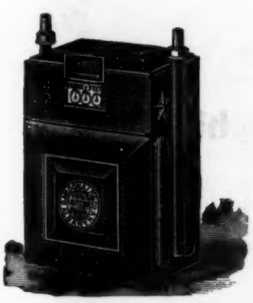

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